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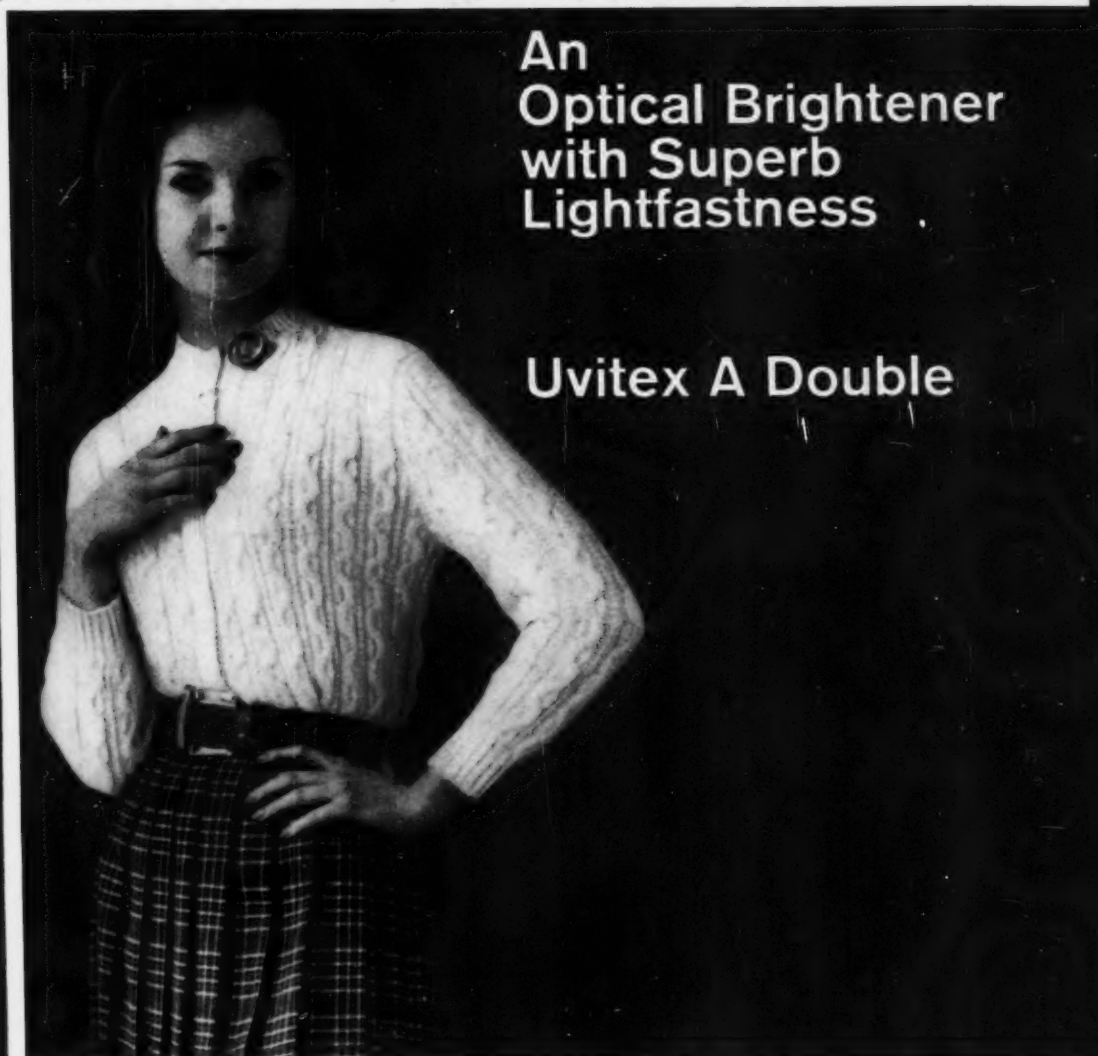
AMERICAN

DYESTUFF REPORTER

TEXTILE WET PROCESSING



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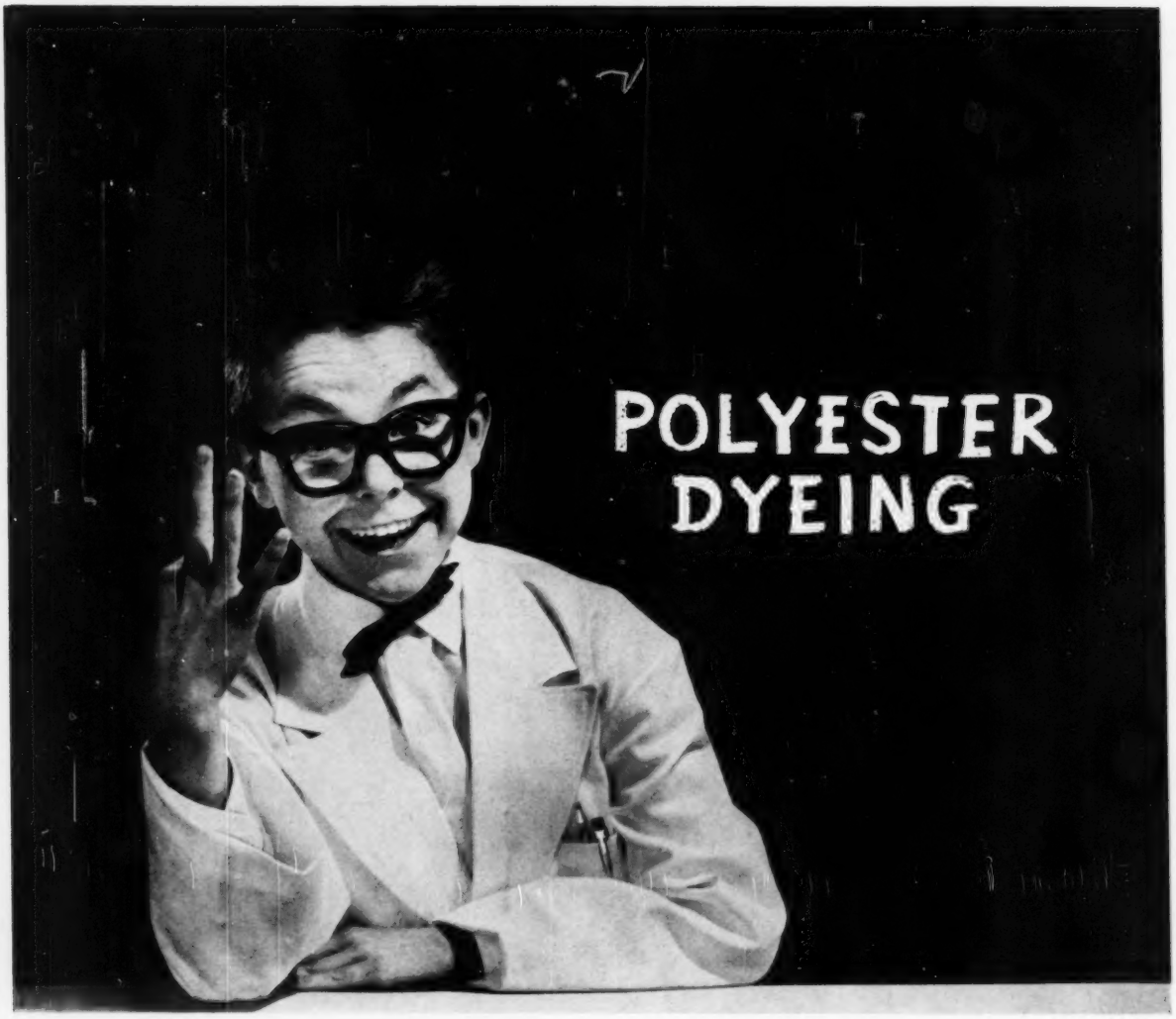

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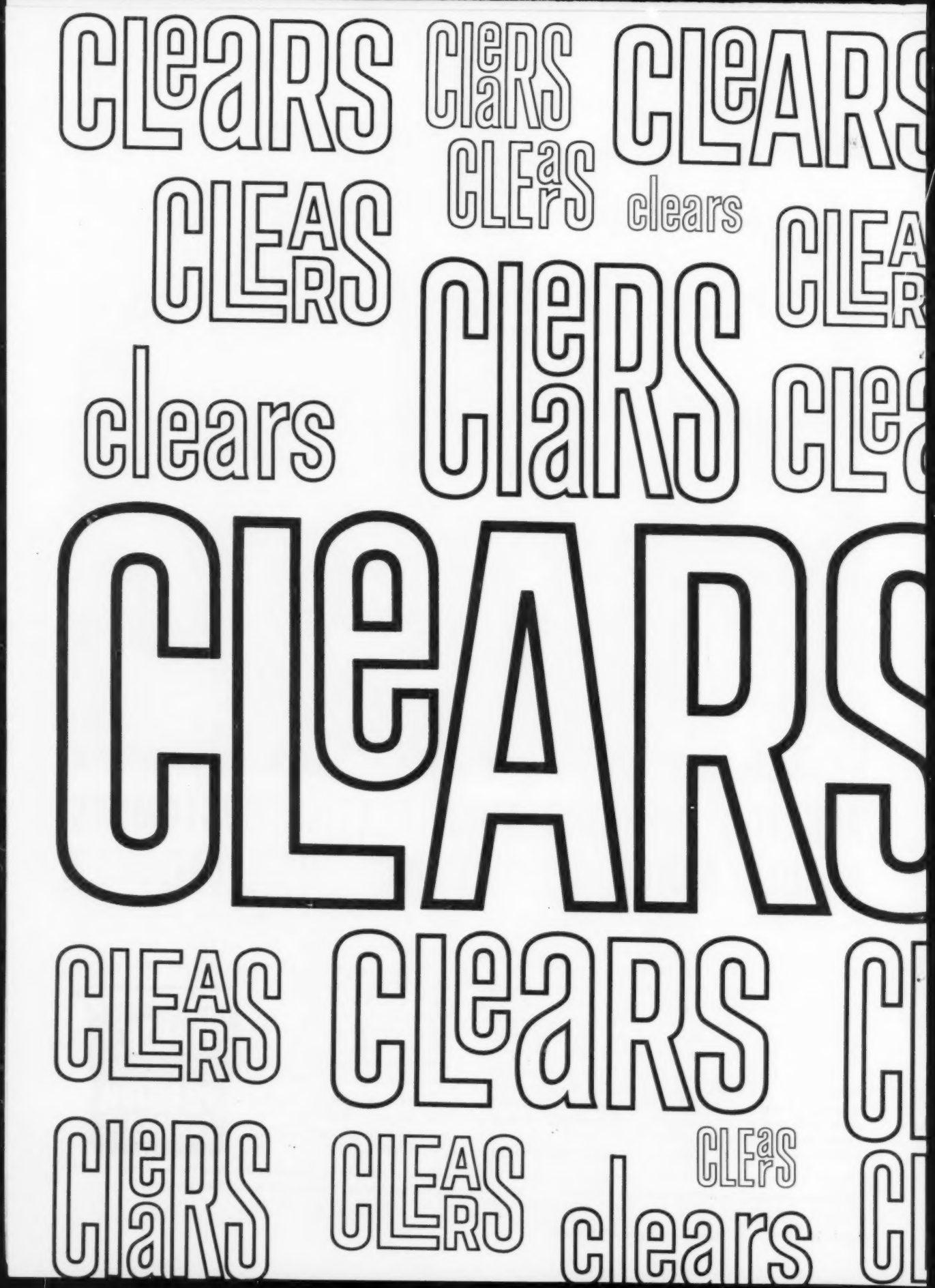
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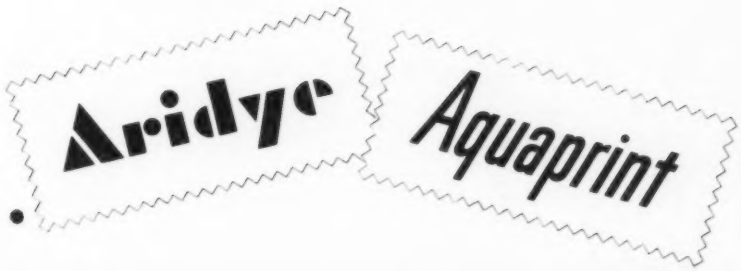

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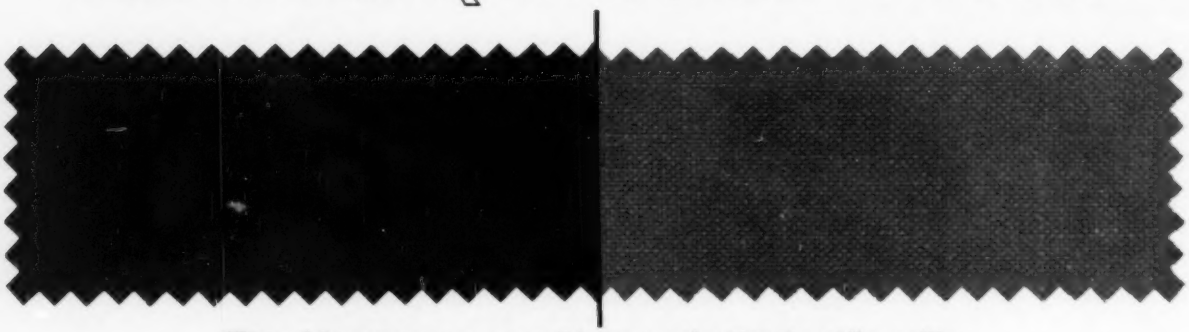

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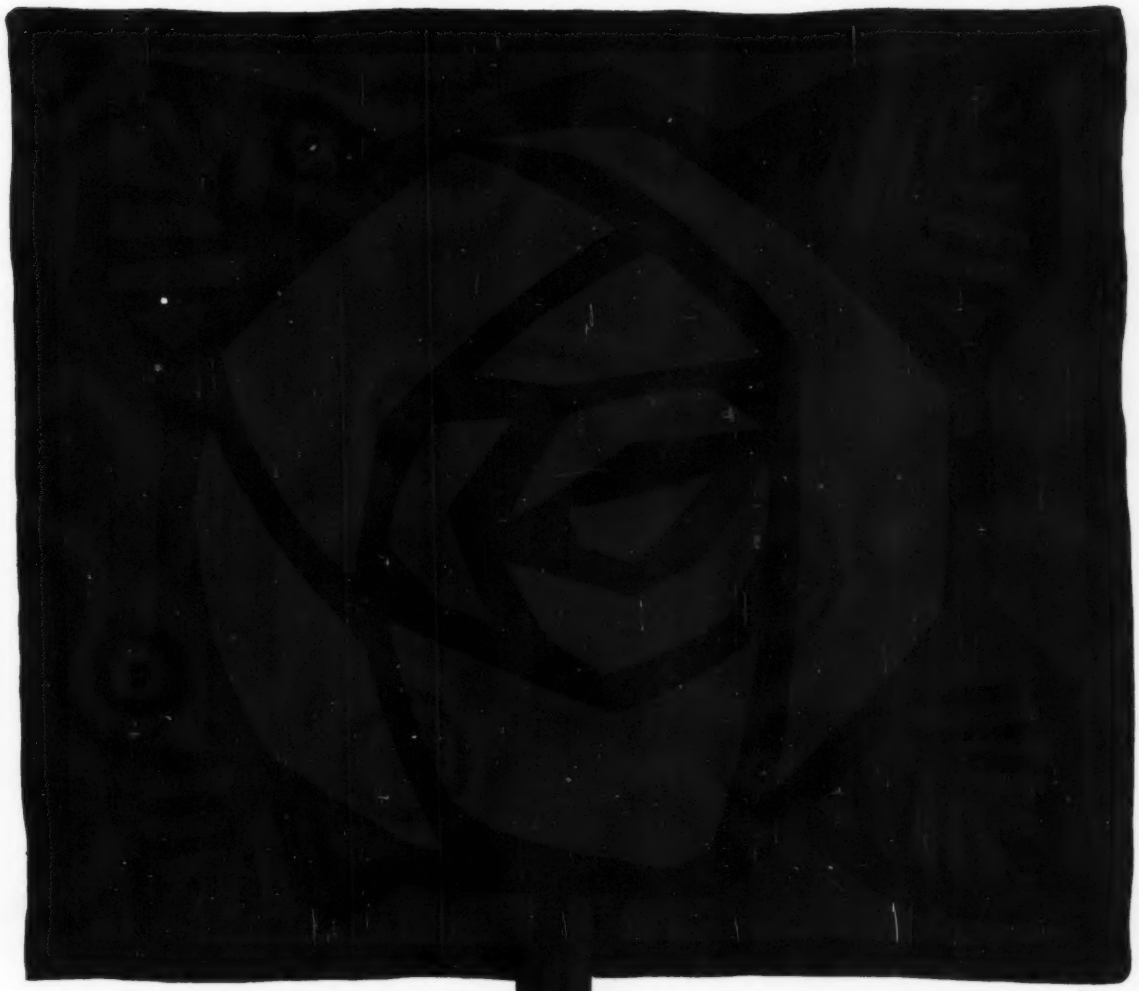

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Brookfield Viscosity (cps. @ 120°C.)	1500	400	455

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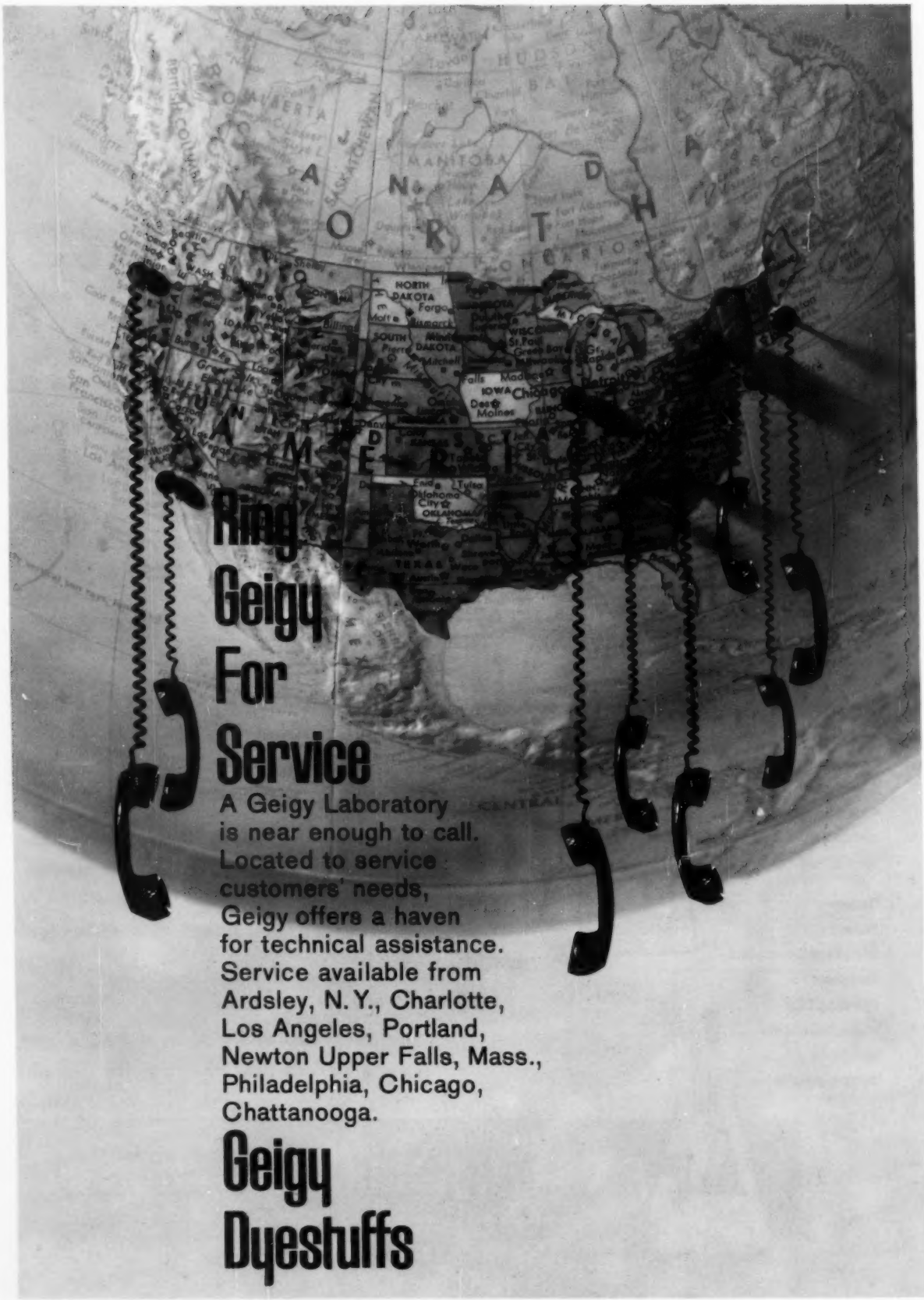
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AMERICAN
DYESTUFF REPORTER
DEVOTED TO TEXTILE WET-PROCESSING

contents

VOLUME 50 March 20, 1961 NUMBER 6

specially contributed

Dimethyloltriazone Finishing Agents with Long-chain Alkyl Substituents for Cotton Textiles 19 (200)
Sidney L Vail, J G Frick Jr, Paul J Murphy Jr and J David Reid
Factors Affecting the Cleansing of Graphite-stained Lace 24 (205)
Norman R Cohen

aatcc proceedings

Organization of the AATCC 31 (P208)
The Textile Consumer Looks to AATCC 32 (P209)
Elliott Morrill
Shade Control for Military Textiles Used by the US Army Quartermaster Corps 34 (P211)
Frank J Rizzo
AATCC Sections and the National Association 44 (P221)
George P Paine
AATCC Calendar 43 (P220)
Membership Applications 48 (P225)
Elected to Membership 48 (P225)
Activities of the Local Sections 49 (P226)
Future Papers 50 (P227)
Employment Register 50 (P227)

departments

Abstracts 23 (204)
General Calendar of Coming Events 55 (229)
ADR News Report 57 (230)
Personalities in the News 59 (232)
New Products and Developments 61 (234)

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Contents of previous issues can be found by consulting the Service and Technology Index and the Engineering Index, at your library

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Specially Contributed

Three new triazones, with n-octyl, n-dodecyl, and n-octadecyl groups as 5-substituents, have been prepared. Dimethylol derivatives of these triazones were examined as reactive finishing agents for cotton fabrics.

Of these, only the one derived from octyltriazone produced wrinkle resistance. The degree of wrinkle resistance was low and it is concluded that this molecule is too large for more than partial access to the fiber and can, therefore, produce only limited wrinkle resistance.

The dimethylol derivatives of the dodecyl- and octadecyltriazone were too large to give wrinkle resistance but did react to give a softening effect to the fabric. The octadecyltriazone produced only a small amount of water repellency whereas the other agents produced less or none at all.

DIMETHYLOLTRIAZONE FINISHING AGENTS WITH LONG-CHAIN ALKYL SUBSTITUENTS FOR COTTON TEXTILES

SIDNEY L VAIL, J G FRICK JR, PAUL J MURPHY JR, and J DAVID REID

Southern Regional Research Laboratory[1]

New Orleans, Louisiana

INTRODUCTION

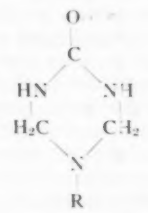
AMONG the most widely used agents for the "wash-and-wear" and wrinkle-resistance finishing of cotton fabrics, particularly white goods, are the dimethyloltriazones. Chemically, an agent of this type is a 5-substituted 1,3-bis (hydroxymethyl) tetrahydro-s-triazin-2(1H)-one; where the 5-substituent is usually a short alkyl group. However, the term "triazone" is very widely used and will be used for the most part in this paper. Reid, *et al* (*1*) have discussed the methylol derivatives of ethyltriazone, hydroxyethyltriazone, and ethyleneditriazone. Wayland (*2*) and Marsh (*3*) have indicated that the ethyltriazone is most often encountered in the textile industry. Blends of the triazones with other N-methylol finishing agents based on urea and urea derivatives (*4*) have also been noted.

Although little has been published concerning the finishing of cellulosic textiles with the methylol derivatives of the many possible 5-substituted triazones, a large number of these triazones have been prepared and characterized, as shown by the list in Table I.

These triazones generally are converted to the dimethylol derivative by reaction with two moles of formaldehyde. On the other hand, the dimethyloltriazones can be prepared directly from the reaction of four moles of formaldehyde with one mole urea and one mole of primary amine without isolation of the triazone itself. It is believed that most commercial products are prepared by the latter method and are probably mixtures of the methylolated triazones and other products.

From Table I it may be noted that the longer-chain 5-alkyltriazones (from C_8-C_{18}) have not been reported and isolated. Therefore, the effects of increasing this chain length of triazone finishing agents have not been studied and reported. The length of the chain can be expected to affect the properties of the treated fabric in at least two important ways. First, only certain regions of the cellulose will be accessible to the agents.

TABLE I
5-Substituted triazones



R	*Melting Point (°C)*	*Author*	*Reference*
Methyl	210	Burke	(5)
Methyl	199d	Paquin	(6)
Ethyl	169-172	Reid, *et al*	(1)
n-Propyl	182	Paquin	(6)
n-Butyl	154-158	Unpublished data	(7)
Isobutyl	194	Paquin	(6)
Isobutyl	200	Burke	(5)
Cyclohexyl	205d	Paquin	(6)
2-Hydroxyethyl	158	Burke	(5)
2-Hydroxyethyl	159-160	Reid, *et al*	(1)
2-Dimethyl-aminoethyl	114	Burke	(5)
2-Aminoethyl[a]	176-7	Paquin	(6)

[a]Using the same diamine and a different procedure Reid, *et al*, isolated the ethyleneditriazone (mp = 195d).

[1]One of the laboratories of the Southern Utilization Research and Development Division, Agricultural Research Service, United States Department of Agriculture.

The effects this selective type of treatment have on useful properties such as wrinkle resistance could be readily determined. Secondly, once the agent is fixed in or on the fiber, the long chains should give the treated fabric desirable benefits from softening and water-repelling actions. A gradation of these effects mentioned above can be expected as the molecular size of the 5-substituent is varied.

In order to study these effects, cotton fabric was treated with these new agents singly and in blends with a typical finishing agent, dimethylolethylene urea (DMEU). The fabrics so obtained were examined for crease recovery, water repellency, resistance to tear, as well as other properties.

EXPERIMENTAL PROCEDURES

All percentages reported in this paper are by weight percent.

I. SYNTHESIS OF TRIAZONES——Pure triazones are often prepared (*1*) by dissolving one mole of urea in a neutralized 37% formaldehyde solution containing two moles of formaldehyde. This solution is allowed to stand from four to 24 hours at room temperature. One mole of the primary amine is then added, with cooling, and the solution allowed to stand one hour or more at room temperature and two hours more on a steam bath. By an alternate procedure, during the addition of the amine the temperature is allowed to rise and the solution heated on a steam bath immediately. In either case, on cooling, the triazone may crystallize out of solution or be isolated by a variety of methods. Neither of these procedures was found to be effective in the preparation of the longer-chain triazones. The product which crystallized from solution appeared to be a formaldehyde-amine condensate, not the triazone. Therefore, the above method was altered in the following ways to prepare the n-octyl-, n-dodecyl-, and n-octadecyltriazones.

Method 1. One mole of urea was mixed with a 37% formalin solution containing two moles of formaldehyde and left overnight at about pH 8. To this was added approximately 800 ml of 2-ethoxyethanol per gram mole of urea and one mole of the amine. During the addition of the amine the solution was cooled to maintain the temperature below 30°C. After standing at room temperature for one hour the solution was refluxed for 20-30 minutes. At this point 30-50 ml benzene was added and the water slowly distilled as an azeotrope from the reaction mixture using a distilling trap. By regulation of rate of benzene and water removal the pot temperature rose to about 125-130°C in four hours. At this point all of the water present, including that formed by the reaction, and most of the benzene had been removed from the mixture. On cooling, the triazone generally crystallized from solution. In some cases, it was necessary to remove part of the solvent under vacuum before crystallization occurred. Before use, the triazones were recrystallized from either methanol, ethanol, or isopropanol.

Method 2. This procedure is essentially the same as the above except that the benzene was not added and the solution was merely refluxed for two to three hours. In this case the pot temperature was fairly constant at 105°C. The product was isolated and purified as above.

Purification of Triazones. In order to obtain a purer product for the melting point determination and nitrogen analysis, the impure products were further purified as indicated below:

After several crystallizations from methanol, octyltriazone or tetrahydro-5-n-octyl-s-triazin-2(1H)-one melted at 147-154°C.

Anal Calculated for $C_{11}H_{23}N_3O$:N, 19.7.
Found: N, 19.4.

After several crystallizations from ethanol, dodecyltriazone or 5-n-dodecyltetrahydro-s-triazin-2(1H)-one melted at 143-150°C.

Anal Calculated for $C_{15}H_{31}N_3O$:N, 15.6.
Found: N, 15.4.

Octadecyltriazone or tetrahydro-5-n-octadecyl-s-triazin-2(1H)-one began melting at 120°C with evolution of a gas. This triazone was obtained after several crystallizations from isopropanol and about 15 hours extraction with ethyl ether.

Anal Calculated for $C_{25}H_{51}N_3O$:N, 11.9.
Found: N, 11.5.

The nitrogen values above, and all values reported in this paper, were determined by the Kjeldahl method.

II. METHYLOLATION OF TRIAZONES——The triazones and the methyloltriazones were both water insoluble. Therefore, the dimethylol derivative had to be prepared either in an emulsion or in another solvent. In all cases the triazones used had been recrystallized at least once after isolation from the reaction mixture. The source of formaldehyde was a 37% aqueous solution except where noted otherwise.

Octyltriazone. To the triazone was added two molar equivalents of formaldehyde and enough water to produce 50 ml of a 10% mixture of the dimethyloloctyltriazone. This mixture was adjusted to pH 8 with sodium hydroxide and heated with stirring at 60°C for twenty minutes. A heavy oily layer developed as the solids disappeared. The mixture was transferred to a high-speed blender and a nonionic surfactant, Triton X-100[2] added (three to four drops per 50-gm mixture). On stirring a clear, stable emulsion was obtained.

Dodecyltriazone—Method 1. A procedure similar to the above was followed but no oily layer resulted. At this point the procedure was changed and enough ethanol was added to produce about a 35% alcoholic solution. On reheating the solution, the solids dissolved and the solution was then heated at 60°C for a total of 1.5 hours. More ethanol was added to obtain a 50% alcoholic solution and the solution was allowed to cool. Solution strength was 4.8% dimethyloldodecyltriazone.

Method 2. Since solids precipitated easily from the solution prepared above, the dimethyloldodecyltriazone was also prepared by dissolving the triazone and two molar equivalents of paraformaldehyde in isopropanol, adjusting the pH as before, and heating at 60°C for about one hour. A solution of 2% of this agent prepared in this manner did not precipitate as easily as the above.

Octadecyltriazone. In this preparation an attempt was made to isolate the methylolated product as dimethyloloctadecyltriazone, whereas in the other preparations the agents were not isolated.

The triazone was dissolved in boiling methyl alcohol and to this was added a slight excess over two molar equivalents of paraformaldehyde. Sodium hydroxide was added as before and the solution boiled for six minutes and then heated at 50-60°C for 24 minutes. As the solution cooled, solids were precipitated and filtered

[2]The mention of trade products and firms does not imply their endorsement by the U S Department of Agriculture over similar products or firms not mentioned.

off. The solids were recrystallized from methanol. After drying in a vacuum oven at 50°C the original solids and the recrystallized solids contained 10.3 and 10.2% nitrogen respectively. Nitrogen calculated for dimethyloloctadecyltriazone = 10.2%.

III. PREPARATION OF PADDING SOLUTIONS——The solutions or emulsion described above were merely mixed with the media or the media containing the DMEU for preparation of the padding solutions. The media are indicated in the tables. If the solution was adequately stirred during the mixing there was no precipitation.

The solid dimethyloloctadecyltriazone was used both in alcoholic solution and in an aqueous emulsion. For use in an aqueous system one part by weight of the agent was dissolved in five parts of dioxane and added to the aqueous system while stirring in a Waring Blendor[2]. The aqueous system contained several drops of the emulsifier (Triton X-100) and the DMEU. The emulsion obtained was stable during fabric treatment, but not stable to overnight storage.

The DMEU used in this study was a 50% aqueous solution prepared from the ethyleneurea with two moles of formaldehyde. The catalyst [0.5% $Zn(NO_3)_2 \cdot 6H_2O$ + 0.05% CH_3COOH] was added to the solution with stirring just prior to padding.

In comparison cases where polyethylene was used as the softener, a commercial polyethylene emulsion, containing 30% solids plus two or three drops of Triton X-100, was added to the DMEU and the solution strength adjusted by the addition of the solvent.

IV. FABRIC TREATMENT——The fabric used in these investigations was an 80 × 80 cotton print cloth which had been desized, caustic boiled, and bleached. Padding was done with squeeze rolls using two dips and two nips at a roll-pressure to give about 80% wet add-on with aqueous solutions. The wet fabric was pinned on frames at its original dimensions, and dried seven minutes at 60°C, and cured three minutes at 160°C, in ovens with circulating air. After curing, all fabrics were washed with a nonionic detergent in a slightly alkaline solution and tumble dried. Fabrics were air-equilibrated for at least four hours before approximate add-ons were determined.

V. EVALUATION OF FINISHED TEXTILES——Breaking strength of the fabric samples was determined on strips raveled to 80 threads by the procedure described by ASTM (*8a*), wrinkle resistance by the Monsanto crease recovery method (*8b*), and tearing strength by the Elmendorf method (*8c*). Resistance to chlorine damage was determined by the AATCC procedure (*9*). Durability of the finish to conditions of service was tested by subjecting the fabric to five launderings as described in AATCC test 91-1958 (*10*), Test IV.

The home-type launderings were performed in a household, automatic washer using conditions recommended for cotton fabrics (130-140°F with a 15-minute wash cycle), not the less severe conditions recommended for some "wash-and-wear" fabrics. The wash water for the wash cycle contained hypochlorite to give 0.02% available chlorine and a normal amount of a commercial detergent. Between washings the fabrics were dried in a tumble drier at medium heat. Wet soiling was determined using a Launder-Ometer with soap solution as the detergent and carbon black as the soiling agent (*11*).

TABLE II

Properties of fabrics treated with dimethylolated octyl-, dodecyl-, and octadecyltriazone

Treating solution[a]				Fabric properties	
Type of triazone	Methylol-triazone (%)	Solvent	Approx add-on (%)	Crease recovery, W & F (deg)	Tearing strength, W (gms)
Octyl	5	water	2.1	242	633
Octyl	10	water	5.1	236	607
Dodecyl	4.8	water-ethanol	1.1	182	773
Octadecyl	2	methanol	0.9	207	640
Octadecyl	5	methanol	7.7	158	717
Octadecyl	10	methanol	14	186	1077
Untreated fabric	—	—	—	170	1190

[a]Catalyst and treating conditions given in "Experimental Procedures."

RESULTS AND DISCUSSION

SYNTHESIS OF TRIAZONES——Method 1 was the preferred method for the synthesis of the triazones. The solids obtained from the reaction mixture were apparently purer (the nitrogen content was higher) than the solids obtained in Method 2. The octyltriazone purified easily; however, the dodecyl- and octadecyltriazones were purified with difficulty. The impurity separated from the triazones appeared to be the formaldehyde-amine condensation product (methyleneamines) from the nitrogen content and molecular weight determinations. This impurity, however, did not appear to interfere in the curing procedures.

DIMETHYLOLTRIAZONE-TREATED FABRICS——The methyloltriazones were added to the fabric by themselves and in blends with DMEU. Table II contains the data concerning fabric treated with the methyloltriazones only.

From Table II it is evident that some wrinkle-resistance properties are obtained with the dimethyloloctyltriazone. Apparently, this molecule is small enough to be a partially effective crosslinking agent, but apparently is too large to produce a good wrinkle-resistant fabric[3]. The finished fabrics were not water repellent.

Neither dimethyloldodecyltriazone or dimethyloloctadecyltriazone produced fabrics with improved wrinkle resistance. Apparently, the dimethyloloctyltriazone must be about the limiting size for producing wrinkle-resistant fabrics. Both the dimethyloldodecyl- and dimethyloloctadecyltriazone produced fabrics of limited water repellency but not enough to be of value. The latter fabrics appeared to be more water repellent than the former.

The dimethyloloctadecyltriazone is presumably a reactive finishing agent and not merely a surface coating of the fiber as indicated by retention of nitrogen content following laundering as illustrated by the following: Three samples were prepared by application of methyl alcohol solutions to give fabrics with nitrogen contents of 0.15, 0.68, and 0.95% for a 2, 5, and 10% solution of the dimethyloloctadecyltriazone. After five AATCC 91-1958 washes the respective nitrogen contents were 0.10, 0.46, and 0.50%. After 15 home launderings the values were 0.03, 0.26, and 0.19%. The other properties of these fabrics are shown in Table II.

[3]The hydrophobic nature, in addition to the steric effects, of the substituent group has also been suggested as a cause for keeping the agent out of the cotton fiber. Methylolation, emulsification, and solution of the agent would alter its hydrophobic nature and provide an argument against this suggestion. Nevertheless, both the steric effects and the hydrophobic nature of the agent are factors which must be considered where accessibility is concerned. Obviously, as the substituent group increases in size both the factors increase.

TABLE III
Use of dimethyloloctyltriazone and dimethyloldodecyltriazone with DMEU

Treating solution[a]					Fabric properties	
Type of triazone	Methylol-triazone (%)	DMEU (%)	Solvent	Approx add-on (%)	Crease recovery angle, W & F (deg)	Tearing strength, W (gms)
—	—	8	water	3.4	289	520
Octyl	2	8	water	4.6	285	527
Dodecyl	3	8	water-ethanol	5.1	307	520
Dodecyl	1.5	7	isopropanol	4.0	292	553
—	—	7	isopropanol	2.6	281	540
Untreated fabric	—	—	—	—	170	1107

[a]Catalysts and treating conditions given in "Experimental Procedures."

TABLE IV
Blends of dimethyloloctadecyltriazone or polyethylene with DMEU

Treating solutions[a]					Fabric properties	
Dimethylol-octadecyl-triazone (%)	Polyethylene (%)	DMEU (%)	Solvent	Approx add-on (%)	Crease recovery angle, W & F (deg)	Tearing strength, W & F (gms)
2	—	10	isopropanol	3.5	304	873
2	—	10	water	5.8	308	793
—	1.5	10	water	5.2	308	827
—	1.5	10	isopropanol	3.9	300	854
—	—	10	isopropanol	3.7	310	727
—	—	10	water	3.9	308	727
2	—	8	isopropanol	3.9	308	840
—	1.5	8	isopropanol	3.3	306	827
—	1.5	8	water	3.9	310	813
—	—	8	isopropanol	2.6	290	754
1.5	—	7	water	3.4	297	840
—	1.5	7	water	3.2	292	906
—	—	7	water	3.0	285	764
Untreated fabric	—	—	—	—	181	1960

[a]Catalysts and treating conditions given in "Experimental Procedures."

USE OF LONG-CHAIN DIMETHYLOLTRIAZONES AS REACTIVE SOFTENERS——The effectiveness of these triazones as softeners was investigated by using them in blends with DMEU. Because they are reactive with cotton they should be durable agents. Polyethylene blended with DMEU was selected for comparison because of its wide commercial usage, but polyethylene is considered to be capable only of coating the surface of the fiber and not capable of reaction with it.

The data in Table III indicate that the dimethylol-octyltriazone and dimethyloldodecyltriazone are only weakly effective softeners. The latter gives a slight increase in crease recovery angles but the tearing strength is not improved.

The data in Table IV indicate that under certain conditions dimethyloloctadecyltriazone appears to be a more effective softener than polyethylene, but under other conditions the polyethylene gives better results. Also, it is concluded that the dimethyloloctadecyltriazone is an effective softening agent whether applied from aqueous emulsion or alcoholic solutions. Increases in crease angle and tearing strength over those fabrics which contain no softener are noted at 7 and 8% DMEU concentrations. At 10% DMEU the crease angle appears to be too high to be affected by the softener; however at this concentration the effects of the softener are noted in improved tearing strength. At these levels of treatment it appears that dimethyloloctadecyltriazone and polyethylene are originally about equal as softeners on finished fabrics before washings.

From Table V it is concluded that the durability as softeners of the polyethylene and the dimethyloloctadecyltriazone are about equal, but with some variation due to the type of washing. Similar results were obtained with fabrics treated with 10% DMEU and these softeners. The durability of the triazone in these washings was mentioned earlier in this paper and appears to agree with the data in Table V.

TABLE V
Effect of laundering on treated fabrics

Treating solution[a]		Fabric properties			
		After 15 home washes		After five AATCC washes	
Dimethylol-octadecyl-triazone (%)	Poly-ethylene (%)	Crease recovery, W & F (deg)	Tearing strength, W (gms)	Crease recovery W & F (deg)	Tearing strength, W (gms)
1.5	—	263	473	287	560
—	1.5	285	567	282	507
—	—	270	447	283	533

[a]Fabrics treated with 7% DMEU in aqueous solution. Catalyst and treating conditions given in "Experimental Procedure."

During the AATCC washes the dimethyloloctadecyltriazone-treated fabrics picked up what was thought to be oily soiling whereas the polyethylene-treated fabrics did not. In a wet soil test (*11*) the dimethyloloctadecyltriazone-treated fabrics picked up less soil than did the polyethylene-treated fabrics. The wet soiling of polyethylene, however, is not considered severe.

SUMMARY AND CONCLUSIONS

Three new triazones (octyl, dodecyl, and octadecyl) have been prepared and isolated by modification of a known method for preparing triazones. Fabrics treated with these methylolated triazones have been examined and it is concluded that treatment with triazones of longer alkyl groups above octyl are ineffective in producing wrinkle-resistant fabrics. However, softening effects with DMEU-treated fabrics are noticed with the dimethyloldodecyltriazone. These effects increase with the increase in length of the alkyl group. Dimethylol-octadecyltriazone appears to be promising as a softening

agent, but had only limited advantages and some disadvantages, when compared with polyethylene. Water repellency of fabrics treated with these agents was not appreciable.

ACKNOWLEDGMENT

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ADR ABSTRACTS

Some Studies on the Cross-linking of Cotton Cellulose. 1. Chemical and Physical Aspects

Perkerson, F S, Reeves, W A and Tripp, V W, *Textile Research J 30*, 944-54 Dec, 1960

Most of the textile chemicals used today to cross-link cotton cellulose are the N-methylol-type compounds. These include dimethylolurea, trimethylolmelamine, dimethylolethyleneurea and dimethylolethyltriazone.

Although all of the N-methylol-type compounds react with cotton under acid-catalyzed conditions, the properties of the modified fabric differ quite significantly. Some of these differences are discussed.

N-methylol-type compounds have a serious weakness —lack of durability, especially to laundering, that has gone almost without attention, the authors say. It should be remembered that the formation of the methylol compounds and the reaction of these compounds with cellulose are both reversible reactions. The reverse hydrolysis reaction is responsible for most of the deficiencies of these compounds.

Several other types of compounds in commercial use and being studied in the laboratory also have faults; eg, APO, a resin presently being commercialized for use in durable "minimum-care" fabrics, causes white fabrics to yellow when bleached and ironed. However, this compound should be excellent for producing extremely durable colored goods.

Cross-linking agents are very effective in producing changes in the physical properties of the cotton fiber. These changes, especially changes in wrinkle recovery, can be brought about by compounds that cross-link the cellulose without self-polymerization. Polymerization reactions that lead to thermosetting resins concurrently with cross-linking of the cellulose do not improve wrinkle-recovery angles, but may improve some related properties that result in better "minimum-care" fabrics. Polymer formation without cross-linking of the cellulose does not improve the wrinkle-recovery angle.

The cross-links referred to above are produced with primary covalent bonds. The value of cross-links produced with secondary valence bonds should not be overlooked, because durable physical changes can be produced with these also. For example, a crease held in position by these secondary forces withstood ten launderings.

The relationship of dry wrinkle resistance to the moisture regain of the fabric is discussed at some length.

Twenty-one references to the literature are cited.

Quality-control Scheme for Crease-resist Fabrics

Anon, *Textile Recorder 78*, 61, Dec, 1960

A new quality-control scheme based on the use of an "Electronic Smoothness Evaluator" has recently been introduced by Cluett, Peabody & Co, Inc, proprietors of the well-known trademark "Sanforized", for use on fabrics which have been given a crease-resist finish, in addition to being shrunk by the "Sanforized" process.

Initially, the scheme is being offered to fabric finishers licensed to use the company's existing trademark covering standards of shrink resistance, and fabrics conforming to both standards will be sold under the trade name "Sanforized-Plus", introduced in connection with the new scheme.

A rigidly specified test schedule has been established to determine minimum performance standards under the scheme, tests covering smoothness after washing, crease resistance, shrinkage, tensile strength and tear strength. In a preliminary evaluation of a potential licensee's fabrics, strength loss on heating and scorching, chlorine retention before and after washing, odor development, lightfastness and discoloration in laundering with and without bleach will be tested, and fabrics will have to conform to minimum standards.

After this initial approval of fabric quality, processing at the finishing plant will be subjected to a strict system of quality control in accordance with a test procedure laid down. Detailed records of test results will be maintained at the finishing plant, and representatives of the licensor's field staff will regularly review test results and make check test of their own.

The "Electronic Smoothness Evaluator" has been developed to give a subjective appraisal of the ability of a crease-resist "wash-and-wear" fabric to dry with a minimum of wrinkles after laundering. After washing under controlled conditions and drip-drying for eight hours, a sample is placed in the evaluator on a cylinder and a traverse mechanism passes it through a beam of light which projects the outline of the cloth surface onto an optical system which incorporates a refractory lens assembly, a magnifying lens assembly, and optical mirrors. A photo-electric cell system converts the outline of the wrinkles into a measurable electric voltage varying with the form of the outline, and this is fed to a recording computer.

The result of these operations is said to be a precise measurement of the degree of wrinkling.

(Additional Abstracts on pages 53 and 55)

FACTORS AFFECTING THE CLEANSING OF GRAPHITE-STAINED LACE

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INTRODUCTION

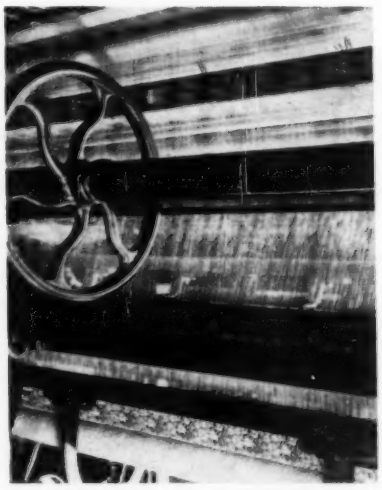
A direct result of the use of graphite as a lubricant for the lace-weaving machine (Fig 1) invented in 1813 by John Leavers, is the problem created in the scouring of finished lace.

The construction of this equipment is such that brass parts move against steel parts of the machine, causing a great deal of friction, which can be reduced or alleviated only through the application of a lubricant. With this end in mind, graphite, lubricating oils, and more recently a Teflon[1] emulsion, have been evaluated as lubricants. The oils and the Teflon were ultimately rejected; the oils because they tended to gum up and cause scoring of the metal, and the Teflon emulsion, although effective, because it was too costly for use on a commercial scale. Thus, graphite, because of its low cost and excellence in reducing friction, remained the accepted lubricant.

As the lace is woven the yarn passes over the lubricated parts and unavoidably picks up the graphite. When the fabric comes off the machine it has a dingy grey-to-black appearance. The finisher is then faced with the problem of cleaning the lace in order to obtain uniformity in subsequent dyeing operations.

The problems involved in the cleansing operation are two-fold, namely: a) the removal of graphite from lace, and b) the ability of the detergent solution to hold the graphite in suspension to prevent redeposition.

This paper deals with the factors affecting the scouring process.



(Courtesy of Wallis & Longden Ltd)

Figure 1
Leavers lace machine

VARIABLES AFFECTING THE SCOURING OF LACE

TYPE OF FIBER———The type of fiber is an important consideration in the cleansing operation. Hart and Compton (*1*) studied soil-fiber complexes by using grease-free carbon blacks on cotton, silk, wool, linen, rayon, nylon, and Fortisan.[2] With a given amount of carbon they showed that the deposition varied widely between textile fibers. The natural fibers (wool, silk, cotton, linen) exhibited heavier soiling than the synthetics (nylon, acetate, viscose-rayon). In the case of nylon, soiling was relatively low; for wool it was very high and cotton was intermediate between these two extremes.

SURFACE CHARACTERISTICS———Weatherburn and Bayley (*2*) studied soil retention with respect to the influence of filament denier and cross-sectional contour. Their findings agree with those of Masland (*3*) in that the degree of soil retention decreases in general with increasing filament denier, and that smooth circular fibers retain less soil than those having an irregular or serrated cross-section. Weatherburn and Bayley believe, however, that the chemical type of the fiber may have a greater influence on soil retention than the physical shape of the filament. It was further shown that fibers of irregular cross-sectional contour not only provide channels which can entrap soil, but also furnish a greater surface area for a given weight of fiber. Moreover, fibers contain many small pits and crevices. Hart and Compton (*4*) proposed that soil retention is largely due to occlusion of small soil particles in these crevices.

TWIST———As a result of a study pertaining to the role of twist on soil retention, Weatherburn and Bayley (*5*) state that, as the twist of the yarn increases from zero, the soil retention correspondingly increases rapidly at low values, owing to the entrapment of soil in the spaces between filaments or fibers throughout the whole interior of the yarn. This soil is not readily dislodged by external influences. With further increase in twist, however, the soil retention reaches a maximum and then gradually decreases as the interior of the yarn becomes inaccessible to the soil particles, and the soil-holding sites finally become limited to those located on the external surface of the yarn.

FABRIC STRUCTURE———Hart and Compton (*6*) established that macro occlusion, or entrapment of soil particles in the intrafiber and interfiber spaces, is another factor of importance in soil retention. In general, it can be stated that, as the weight and complexity of fabric structure increases, the number of macro-occluded soil particles increases.

TYPE OF GRAPHITE LUBRICANT——The presence of grease is an important factor in the bonding

[1]Registered trademark, E I du Pont de Nemours & Co, Inc
[2]Registered trademark, Celanese Corp of America

structure of graphite to the fiber (7). When grease is present, a sorptive binding of graphite to the fiber occurs. Hart and Compton showed that, in general, the retention of graphite is greater in a grease-free system. This is due to the fact that grease-free carbon black dispersions are of much smaller particle size than greasy carbon black dispersions.

PHYSICAL CHEMISTRY OF SOILING AND SCOURING

BINDING MECHANISMS OF SOIL TO FIBER——There are three possible binding mechanisms for a soil-fiber complex. These are: a) macro occlusion, or entrapment of particles in the intrafiber and interfiber spaces; b) micro occlusion, or entrapment of particles in the irregularities of the fiber surfaces; and c) sorptive bonding of the soil to the fiber by van der Waals' or coulombic forces (*8*).

ELECTRICAL EFFECTS IN DETERGENCY——Stillo and Kolat (*9*) and Harris (*10*) demonstrated the relationship existing between the redeposition of graphite on fabric and the zeta potential (electrical repulsive potential). When certain protective colloids are added to a detergent system, a lower zeta potential results. They proved that redeposition is at a minimum when the zeta potentials of both graphite and the fabric are equal. Rosch (*11*), on the other hand, found that high detergency occurs where both the soil and the fiber have a high zeta potential. However, this relationship does not hold true in a system where the surfactant is nonionic. In nonionic systems having low zeta potential, the detergency is high.

Hock (*12*) showed that redeposition of the graphite on the cloth is prevented when soap particles surround graphite particles. This repulsion effect is probably due to an equivalence of charges between the soil-soap complex and the substrate-soap complex.

The theory of zeta potential versus detergency has many exceptions, but, in the main, where built anionic detergents are used, the electrical charge on the fibers and soil particles have a marked effect upon detergency.

Oddly enough, due to the zeta potential, the fiber type will affect the suspending power of different surfactants. Synergistic effects of surfactants also depend greatly on the entire soil-fiber surfactant system.

DETERGENT SYSTEMS

REQUIREMENTS OF A GRAPHITE REMOVER——An effective graphite remover must be capable of the cleansing operation as described in the introduction.

A typical graphite remover producing these effects will usually contain casein, carboxymethyl cellulose (CMC), and other protective colloids, dispersants, suitable builders, and surfactants.

PROTECTIVE COLLOIDS——The protective colloid, usually casein, is the heart of the graphite remover. It has the ability to suspend the graphite after its removal from the lace and prevent its redeposition. The graphite remover is distinct from other detergents, for it must be dissolved in hot water (160-180°F) with the aid of mechanical agitation.

BUILDERS——The presence of a builder will enhance the soil-removing power of a detergent. According to the findings of Harris (*13*), silicates and phosphates in conjunction with a sodium soap gave better antiredeposition effects than the soap alone. His work also proved that the incorporation of sodium carboxymethyl cellulose (NaCMC) into the builder-surfactant system improved the retention of whiteness in the fabric. Since calcium and magnesium ions tend to increase soil deposition, a sequestering agent such as the tetrasodium salt of ethylenediaminetetraacetic acid (EDTA) or sodium tripolyphosphate should be added.

OPTICAL BLEACHES——Some manufacturers of graphite removers add an optical bleach to their formulation. The optical bleach absorbs light in the ultraviolet nonvisible region and reflects it with greater intensity in the visible region. Therefore, the optical effect of a bright, white, and clean lace is given. The results, however, may be misleading since the lace may appear to be clean, although it may still contain graphite particles. In subsequent dyeing operations these resist-spots will cause unevenness of color.

LABORATORY SCOURABILITY TESTS

RAPID OR MANUAL METHOD——The following technique is an efficient and rapid method for determining the most effective graphite remover.

Procedure: Ten-gram swatches of graphite-stained lace are selected. This lace has been manufactured on the Leavers machine and consequently should be uniformly soiled. Each detergent solution is prepared by dissolving four grams of detergent in 50 grams of water at 160°F with the aid of mechanical agitation. Cold water (46 grams) is then added to yield a 4% solution. The scouring solution is added to a 500-gram beaker and allowed to cool to room temperature (70-80°F). The 10-gram piece of graphite-stained lace is dipped in this scouring liquor and then hand-nipped five times with a pair of serrated rubber gloves. This operation is repeated 35 times. The lace is then rinsed in cool water and dried.

An ultraviolet light must first be used on the clean swatches to determine if an optical bleach was present in the detergent. If an optical bleach is used, it is impossible to evaluate results.

The comparisons of the various detergents' scouring abilities must be visual since it is impossible to obtain reproducible reflectance values on the Gardner Multipurpose Reflectometer due to the construction of the lace. The swatches of dried lace are compared by folding them several times in order to obtain a piece approximately two-by-two inches square. The degree of whiteness is judged by comparing the same design in the lace weave.

LABORATORY PADDER METHOD——If a more critical test is deemed necessary, a laboratory padder can be employed. A 100-gram sample of lace 10 inches wide is loaded into the padder. One-hundred grams of a 15% detergent solution is added to the dry lace. The scour is run for one and one-half hours, and the lace is then given a 15-minute running rinse. The samples are dried and compared.

TEST RESULTS——In previous sections, it was noted that an efficient graphite remover must contain protective colloids, dispersants, builders, and suitable detergents. To determine the best scouring agent, a series of detergents was tested in conjunction with a compounded base containing casein, alkaline agent, and selected builders. To this base, 10% of each detergent was added and the effectiveness of each was determined by the tests described above. In Table I, the detergents

TABLE I

Detergent cleansing power
(in order of decreasing effectiveness)

Detergent Type	*Appearance of nylon lace*
Sulfated amide	White (foaming problem)
Fatty amide	White (foaming problem)
Ethoxylated nonyl phenol (9:1 mole ratio of ethylene oxide to phenol)	Grey-white
Sodium oleate	Grey
Alkyl aryl sulfonate	Grey with black specks

TABLE II

Comparison of the two-bath and the one-bath scouring systems

TWO-BATH

Advantages	*Disadvantages*
1) Most of the graphite is removed in the first bath so that redeposition is kept at a minimum.	1) Since large volumes of water are necessary, more detergent is needed to meet proper concentration.
2) Since a large proportion of the graphite has been removed in the first bath, the scouring liquor in the second bath is relatively clean. It is possible, therefore, to determine the degree of whiteness of the lace. If necessary, additional detergent can be added while the lace is running.	2) The process is a lengthy one.

ONE-BATH

1) Since less liquor is needed, less detergent is used, resulting in lower cost.	1) Until the final rinse is employed, the lace is covered with the detergent solution which is grey to black in appearance. Therefore, the effectiveness of the detergent cannot be seen until the scouring operation is complete.
2) Since the detergent solution is added directly to the dry lace, the first liquor to reach the interior of the lace contains detergent. The attrition of the rolls aids the scouring liquor in lifting out the graphite.	

have been ranked in the order of decreasing cleansing properties.

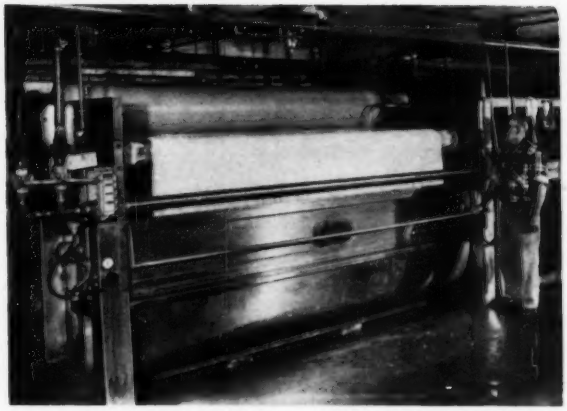
With a trial-and-error method of combining the various specific detergents selected from the above five types, it was possible to derive a balanced graphite remover that had optimum cleansing properties. A proprietary product that resulted from this investigation is being sold commercially in the form of a powdered mixture by the Textile Division, Sonneborn Chemical and Refining Corp (Sonolene GR).

EQUIPMENT REQUIREMENTS AND METHODS OF SCOURING

Scouring equipment will vary from mill to mill, differing mainly in liquor volume. The two major scouring procedures in use today, the two-bath system and one-bath system, are compared in Table II.

The two-bath system is usually utilized where a long bath (large liquor-to-goods ratio) is employed. The graphite-stained lace is loaded into the scouring beck (Fig 2), and a 15-minute running rinse is employed to remove the surface graphite. During this time, the powdered graphite remover is added to hot water (160-180°F) and dissolved with the aid of mechanical agitation. After the detergent is completely dissolved, cool water is added to lower the solution's temperature[a] and bring it to proper concentration (15%). One-third of the scouring liquor is added to the beck, and the lace

[a]The scouring solution must be cooled because acetate may be present in the lace in the form of pull threads. If the temperature is high and the pH of the scouring liquor is above 9.2, saponification of the pull threads could result.



(Courtesy of Rodney Hunt Machine Co)

Figure 2

Scouring beck

is run for one hour. The bath is dropped, and a running rinse is employed. At this time, the bulk of the graphite is removed. The balance of the scouring solution is added, and the goods are run for an additional four to six hours. The bath is then dropped, the goods are rinsed, and the scouring operation is complete.

The one-bath operation is run with a short bath (low liquor-to-goods ratio). The scouring liquor, a 15% solution, is added directly to the dry lace. In this system, the scouring liquor is so low that none is visible in the bottom of the beck. The goods are run this way for four to six hours, a running rinse is applied, and the scour is then complete.

CONCLUSION

This paper has dealt with the variables encountered in scouring graphite-stained lace. Differences such as fiber type, surface characteristics, yarn twist, fabric structure, type of graphite, detergent, scouring equipment, and the method of scouring all affect the cleansing operation. From all available evidence, it can be concluded that the one-bath method is the superior scouring technique.

In conclusion, it can be stated that there is a definite complexity of problems involved in the scouring of graphite-stained lace. Each type of lace must receive individual attention and treatment. There is no single method which is universally applicable.

ACKNOWEDGMENT

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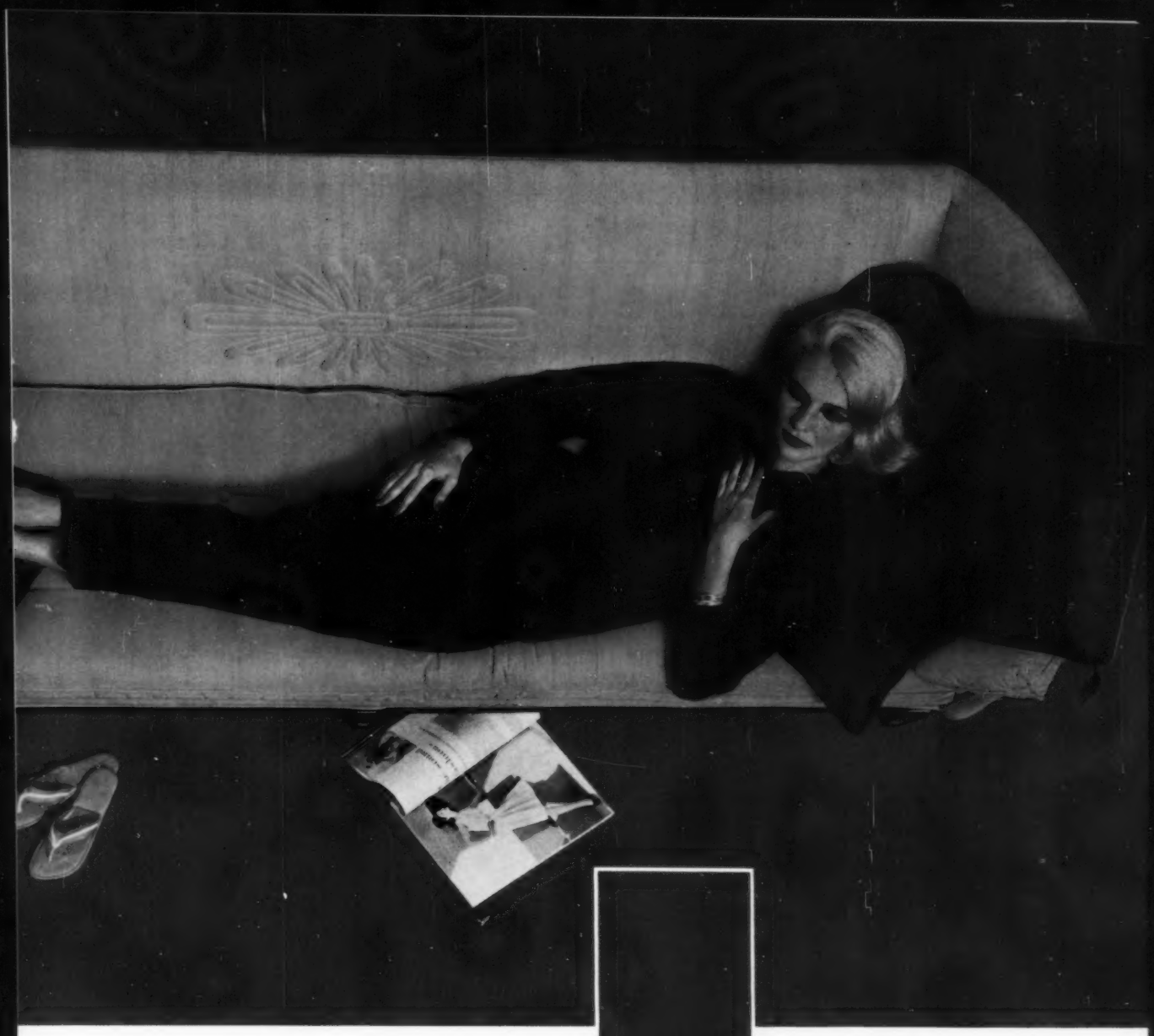

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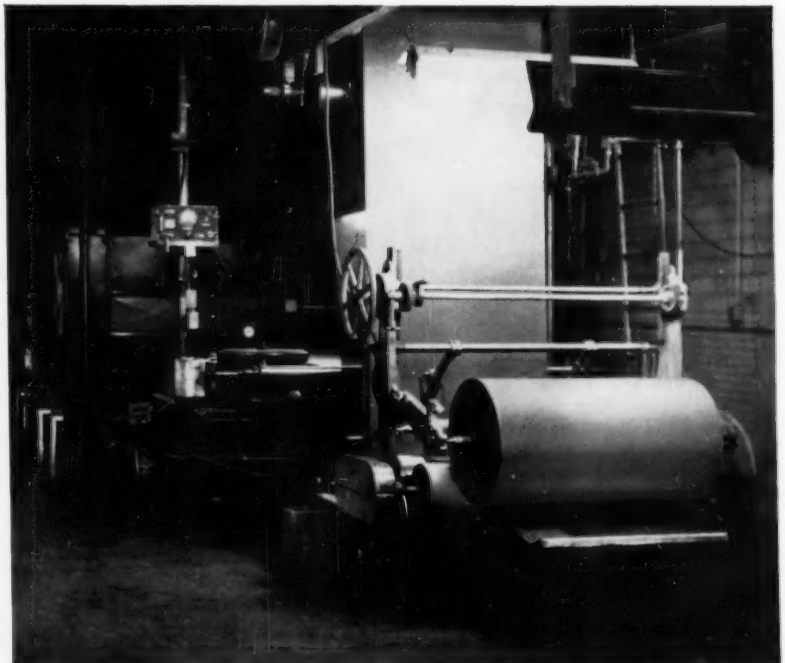

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South Central Section———

THE TEXTILE CONSUMER LOOKS TO AATCC*

ELLIOTT MORRILL
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MR Chairman, ladies and gentlemen, members and guests of the South Central Section of the American Association of Textile Chemists and Colorists, I am honored indeed that you have asked me to address you and to have this opportunity to visit with you in Chattanooga. Allow me, please, to express my thanks for your hospitality and warm welcome extended to Mrs Morrill and myself.

You have heard a talk from our executive secretary this afternoon in which he outlined the relationship between the National Organization and your Section. I am sure that he made it a point to let you know that the vitality of your National Organization is derived from the Sections, because it is the Sections, through their representatives on the Council, which actually run the Association.

In an organization such as ours, it is essential that you in your Sections keep your Councilors well advised of your thinking on various matters involving the Association. It is equally important for your national officers to inform you through your Councilors of the actions contemplated and taken by the Council and the Executive Committee.

It is with this in mind that I would like to talk to you about the role of AATCC and its obligations to its members and to the industry.

It is quite in order for me, I think, to take a slight advantage of the male attendance here this evening and address some of the remarks that I am going to make to the ladies, because I think that we are all agreed that none of us would have been able to get where we are nor would our Association or industry have survived without their unflagging support.

At the National Convention in Philadelphia our immediate past president, Weldon G Helmus, in his "State of the Association" address seeking to set forth the direction AATCC would take, made the following statement: "Let us point our research program more directly to the consumer, providing a technical and scientific bridge between our industry and the consuming public." I am sure that AATCC can do much through its association of technically trained individual members to help bridge the gap that exists between the textile industry and the consuming public.

I am equally sure that all of you know that AATCC is considered the outstanding authority on test methods. "These test methods serve as a yardstick of measurement," as Charles Sylvester so aptly puts it, "which provides a common language between the sales department and the laboratory, the laboratory and production, the buyer and the seller." Regardless of how widespread these test methods are used or adapted to fulfill the needs of the industry, they require, because of their technical language, correct interpretation in terms understandable by the layman.

Please do not infer that I am talking about performance standards because that is not the business of AATCC. Our business is test methods, and I use these as an example of the need for better understanding on the part of all concerned of the application of the technical methods to our common goal of producing quality merchandise at economically sound costs and fair prices to the consumer.

During the years since the close of World War II, we have all seen appearing on the horizon many powerful factors that have influenced the textile industry as a whole, as well as the activities of our Association. While it is particularly needless for me to point these out, I might mention some of the more obvious ones—the relocation of the center of the producing textile industry, the utilization of chemical processes for producing textile fibers, the influence of "easy-care" clothing of all types, the influence of foreign competition, and the never-ending struggle to produce quality merchandise at sound economic levels.

These factors have profoundly affected all of us who make our living directly or indirectly within the framework of the textile industry, and in many ways have affected the thinking and attitude of people that manufacture textile products, as well as those who buy and use textile products.

It seems incongruous to me that an industry as efficient and effective as the textile industry is in providing clothing and all of the many textile materials used in our homes, businesses, and national industries, has the reflection that it does in the eyes of the general public and government. To develop this point in detail would be, frankly, taking unfair advantage of you, but I would sincerely commend for your reading Irene Blunt's address before the 1960 Convention entitled, "The Textile Industry Looks Ahead." This is published in the *Proceedings* under date of November 28, 1960, in *American Dyestuff Reporter*. I feel that anyone reading this inspiring message cannot help but have his thinking about the textile industry reoriented in a most wholesome and refreshing manner.

I am sure that all members of AATCC would agree with me when I say that I am proud that my activities over the past thirty-odd years have been directly or indirectly related to the textile industry.

I think those of us in AATCC, particularly, should try to influence the thinking, for example, of the young men and women about to make a decision as to the career that they will follow.

A career in textiles for a properly trained graduate of a textile school, college, or institute, cannot only provide an interesting business or technical life full of engrossing challenges, but, as a practical matter, can be rewarding in other ways, including compensation.

The textile industry needs these young men and women, and these young men and women need the textile industry.

I know from my own personal experience that the textile industry has certainly been good to me, and I dare say many of the folks in this room will subscribe to my personal feelings.

*Presented before the South Central Section at Chattanooga, Tenn, February 18, 1961.

One of the big problems, it seems to me, that we will face in any endeavor we undertake is to gain the good will of the people we serve, the people we do business with, and the people that we work and play with. All of us in some fashion or other are endeavoring to have our reflection in the minds of these people be a favorable one.

At the risk of using an advertising man's expression, I would say that we are all trying to create the "image" of ourselves, our interests, or our products in the minds of other people.

Insofar as the American Association of Textile Chemists and Colorists is concerned, I cannot help feeling sometimes that we are guilty of "hiding our light under a bushel," or in some way failing to create the true reflection of what our Association really is. I think that we could do well to tell our story with humility and true consideration for the real worth of the Association. For example, the publication of the *Colour Index*, which we have produced jointly with the Society of Dyers and Colourists, is in itself no mean achievement, and we have every right to feel justly proud of being cosponsors of the most authoritative documentary of dyes in the whole world. Had AATCC done nothing but this in forty years, all of the work accomplished by the members of our Association would have had to add up very far on the plus side.

What our public does not know is that, in addition to many things that might be considered routine for an organization such as ours, we have within our membership the outstanding scientists, technical people from laboratories and production units, and technical service people. This group operates continuously in the fields of textile and chemical research through over five-hundred volunteer workers comprising some ninety-odd technical reference committees. Within its membership are knowledgeable people of many capabilities who, joined together, bring to bear on problems the talents and abilities necessary to solve them and make it possible to provide better services and goods for us all.

Our *Technical Manual* (published and up-dated annually) containing our test methods developed by these volunteer workers with the generous and wholehearted support of our Corporate Members of the textile and related industries, contains a great deal of additional information, including a tabulation of American-made dyes and textile chemical specialties. This is the second major achievement of your Association.

Rather than to go on in this vein on what your Association has done and is doing, I would like to take a look with you into the future as to possible courses of action open to the Association. To start with, in 1958 the management of our Association—the Council—appointed a Study Committee on Long-Range Objectives.

One of the recommendations this Study Committee made was that a standing committee of the Council be established which would be called "a committee for consumers' interests," and indicated that such a committee should work with those organizations actively interested in the consumer areas of our industry, stemming from which a well-conceived and operating information program about AATCC, textiles, and colors could be implemented.

This is one of the sixteen recommendations the Study Committee made and which the Council directed the Executive Committee to make a further study. In my talk to you this evening, I am not going to even hazard a guess on how this recommendation will wind up, but since it is a matter of published record in our *Proceedings* under date of February 22, 1960, I would like to use the remaining portion of my time to tell you a little bit about how an organization for consumers' interests within a large organization actually has worked with very gratifying results over the past forty-odd years.

One of the products that my company manufactures is a household package dye. This product is used in the home under a wide variety of conditions, by both men and women, and by all age groups. Like products made by the textile industry, this product is highly competitive and to be successful a company must have the necessary technical talent, sound production methods, quality-control inspection, and effective advertising, merchandising and selling if it is to remain a contender in the struggle for business.

Approximately forty years ago a separate department was established within the company for the primary purpose of dealing directly with the consumer. This department was set up so that the head of the department had the opportunity to report periodically and frequently direct to the top management of the company. A decision was made to tie this department in, for purely operating purposes, with the technical side of our business, but with full freedom of action to deal with the selling, advertising, and merchandising people on an equal basis so that the consumer's voice could be heard in the deliberations that went on, which resulted in positive action being taken in terms of product, advertising, merchandising, etc. Because we felt that this department should be the guardian of the consumer's interest and because we had reason to believe that the majority of our customers were women, this department has always been headed by a woman. We have been singularly fortunate that over the forty-year span we had some exceptionally talented and understanding directors of this department, and that the turnover has been insignificant.

The department also is staffed by women, and, in keeping with the concept of this department, they are not technically trained women in the sense that they are all college graduates. Rather they are a good cross section taken from the career girl, the young housewife, the middle-aged homemaker, and the grandmother. To further keep this department in its proper perspective, its laboratory facilities for testing and evaluating purposes were deliberately kept in a homelike atmosphere, and their tools are the same as will be found in any home laundry or kitchen. While they were backed up by research and quality-control laboratories, this was done only to provide them with a source of technical information should the occasion require.

The first thing that is basic to this department in its operating phase is that it provide a service to the consumer; the second, that it provide a service to the company. It was stipulated that any other department of the company needing display material, color card material, props for television commercials, movies, etc, used in advertising or display materials used at association meetings, conventions and the like, would receive them from this department.

A further limitation was placed on this department in that the only dyes that would be used in preparing these "props" would be the current household dye products being manufactured. In short, they were put in the position of being required to use only the product we expected our customers to use.

(*concluded on page 47*)

Rhode Island Section———

SHADE CONTROL FOR MILITARY TEXTILES USED BY THE U S ARMY QUARTERMASTER CORPS*

F J RIZZO

Quartermaster Research and Engineering Command

Natick, Mass

Shade control is an extremely important aspect in the procurement of military textiles because color contributes to appearance, morale, and the solution of many other problems.

The various steps taken by the Quartermaster Corps in the control of shades are delineated and many of the major problems still outstanding are revealed. The work that has been accomplished to date has resulted in a much improved quality of product and in the easing of problem areas that existed at one time.

There are potential areas of further effort which will transform the present control from subjective methods to more precise measurement systems. The problems to be solved in this translation are revealed.

INTRODUCTION

THE average individual's concept of the color attributes of military clothing and gear is apt to be expressed by the term "drab." That this is a misconception becomes evident from a review of the history of armies in general. Kennedy (*1*) has shown not only that a broad color gamut has been a tradition in military establishments for many centuries but also that a modern army, such as the U S Army, uses color in an infinite variety of ways to achieve good appearance for routine and ceremonial duties, to build morale, to effect concealment and deception in combat, to identify, signal, safety code, decorate, and in general to enliven the spirit and to afford pride in the organization and the cause for which it exists.

The problems associated with these many applications of color formed one of the many reasons that influenced the post-war decision by the U S Army to undertake research in the general area of dyeing and finishing. More specifically, the experiences of World War II had shown that complete reliance upon broadly defined specifications, even with the best intentions and efforts of individual members of the industry, was not productive of those quality levels required by the U S Army. Already too, the broadening base of fibers coming from the laboratories and the plants of the chemical industry was making inroads into the stable position held by the natural fibers, wool and cotton. The increased activity of both the dyestuff and chemical industries in producing new dyes and finishes, coupled with the problems arising from the increasing automation in the mills, initially stimulated by the war, raised additional problems, many of which were immensely complex and potentially a source of quality variations.

The situation was significantly apparent in the field of shade and colorfastness. World War II deliveries of colored textiles had shown an urgent need for quality-control measures. Even allowing for the urgencies and problems imposed by wartime demand, shade variation was more than "commercial". Fading levels and tonal changes varied widely; metamerism was a common experience not only between the products of different manufacturers but startingly enough, quite often in the product of each manufacturer. This then was the background to the actions which have led to today's specifications in the field of color of military textiles and to those that may come in the immediate future.

*Presented before the Rhode Island Section in March, 1959.

THE EXPERIMENTAL APPROACH TO COLOR SPECIFICATION

Thus, immediately after the war, with the advice of industrial consultants, the Quartermaster Corps technical staff formulated and pursued a number of basic studies designed to assure the desired quality levels in military textiles. The goals that were set were with the full realization that the best that could possibly be established would necessarily be a compromise between the desire for near perfection on the part of the military and the realities of industrial capabilities and technological efficiency. The attack on the problem has been a logical step-by-step development, each leading gradually into the next and still full of potential for further advances.

A) STUDIES OF INDUSTRIAL FACTORS———As a background to these actions, there was a need to elucidate the many specific factors contributing to the variabilities and to understand more fully the mechanisms that determine the level of results that were obtained in the industry as well as to assess the optimum levels which were technologically achievable. To this end, studies, such as those undertaken with the American Association of Textile Chemists and Colorists on the influence of preparation processes on the colorfastness of vat-dyed OD-7 cotton textiles, reported by Rizzo and Bailey (*2*), were supported. This particular study showed that quality levels of batch- and continuously dyed cotton textiles could be improved and brought into narrow range by marrying the proper factors in the preparatory scheme as well as by choice of appropriate dyestuff formulation. Studies in many other areas have helped to define the attainable levels of quality.

B) COLOR-MATCHING CONDITIONS———One of the areas which had led to occasional misunderstanding between the Government and industry originated with the unstabilized conditions of viewing for color matching used in the industry. To this end, the findings of the special panel of the Inter-Society Color Council (*3*) on a standard illuminant duplicating average north sky daylight used by dyers in color matching were implemented. The Quartermaster Corps had participated in this study. Thus, the present-day color-matching requirements, first introduced in 1947, were born and have served to improve understanding between the Government and industry. These conditions require a match under 7500°K and a good approximation to a match under 2800°K. The practical implementation of this is illustrated in Figure 1.

Further studies along lines similar to those recently reported by Reese (*4*) will in due course of time result in further refinements of this tech-

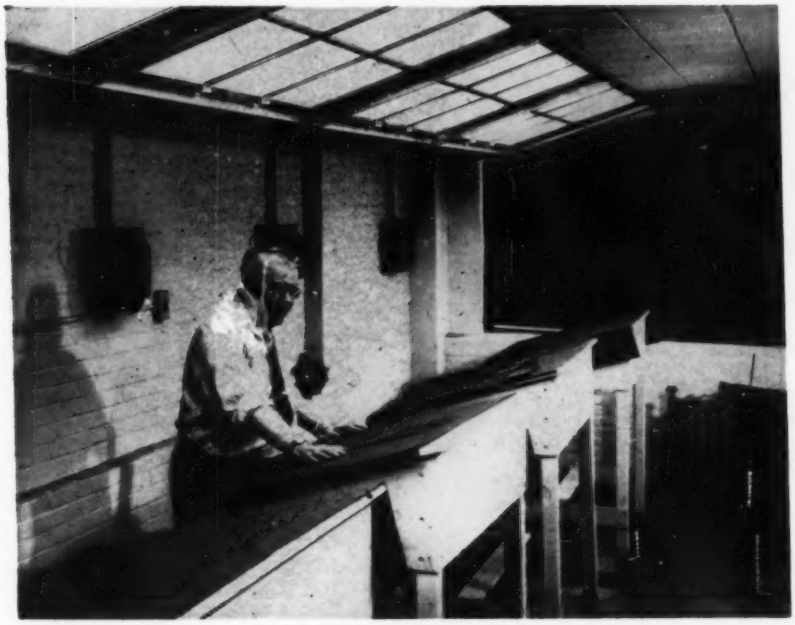

Figure 1
Standard color-matching conditions—Illuminant "D"

nique. Figure 2 illustrates one variable, namely that of angle of viewing, which contributes to what one sees at the shade board.

C) STANDARD DYE FORMULATION STUDIES———Perhaps the most significant step taken in the early post-war years was to control shade through the dye formulations used by the industry. The pattern for this had been laid with AATCC participation in the war years when a group of members started work on OD-33, at that time both a combat and service color (5). This study had shown that a substantial improvement in the quality levels of this shade could be realized even after compromises of both a technical as well as an economic nature.

Thus, in early 1947, the Research and Development Division of the Office of The Quartermaster General took a bold step forward, somewhat with tongue in cheek, and introduced the first mandatory dye formulation into specifications by requiring a fixed group of dyes for color matching OD-33 shade. The ensuing period was fraught with problems for both the industry and the Army as adaptation to this inoculation of a new concept took place. By the time all the harsh words had been said and the general atmosphere had cleared, both sides realized that the inoculation had been effective with beneficial results to both sides. Quality levels improved materially, rejections for shade and colorfastness dropped sharply and a new insight into the problems of color control of military textiles had been gained.

Above all there was achieved the realization that the kind of color control which was adequate to civilian needs was in reality only of a general qualitative nature. Contrary-wise for military purposes, the specific end-use requirements, the methods necessarily required to produce large numbers of uniforms from the product of many industrial units of varying physical composition and technological capabilities, and the variable properties of the raw materials themselves required quantitative control of a degree which could be met only with the best efforts of all participants.

In the civilian trade, differences in shade fit well into the style and fashion trends of the day and in general are welcomed or tolerated for this reason. One need only refer to the tentative definitions given by the ISCC Committee on Standardization of Discriminative Terms in Color, adopted in 1940, to see how tolerant the civilian trade really is in the matter of color control. (See Table I).

TABLE I
Inter-Society Color Council
Tentative Definitions of
Color Differences

Adjective Definition	*NBS units*
Trace	0.0- 0.5
Slight	0.5- 1.5
Noticeable	1.5- 3.0
Appreciable	3.0- 6.0
Much	6.0-12.0
Very much	Greater than 12.0

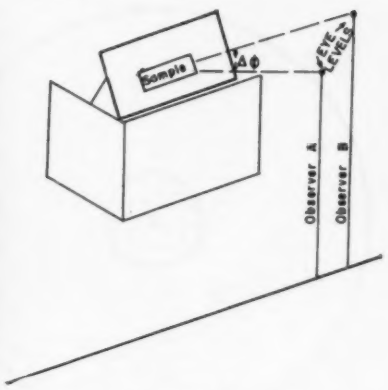

Figure 2
Effect of eye level on viewing conditions

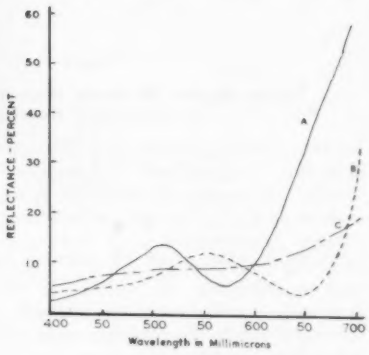

Figure 3
Spectral characteristics of metameric pairs

Skinkle and Platt (6) have assessed the impact of market conditions on the tolerance allowed in commercial textile transactions. The tolerance is obviously smaller in a buyer's than in a seller's market. Any of these approaches are definitely too liberal for Quartermaster needs.

In military items, differences in shade, in fading characteristics, or in tonal variations under different lights (metamerism) (7) (see figure 3) can be critical in terms of the appearance or of the security from detection of the individual wearing it. Thus, as these facts achieved their appropriate significance in the minds of government and industry technical groups which had been grappling with these and other problems that had concerned them both in their mutual relations, mechanisms of dyeing, dyebath control factors and the physicochemical relations between fiber and dyebath began to assume position as

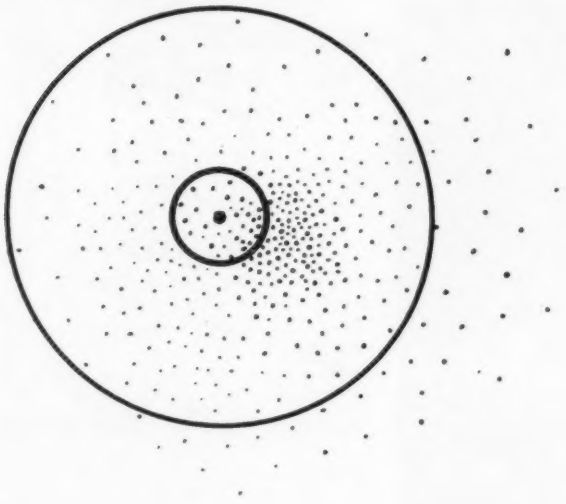

Figure 4

Scatter diagram of random attempts to hit a target. (Illustrated skewing)

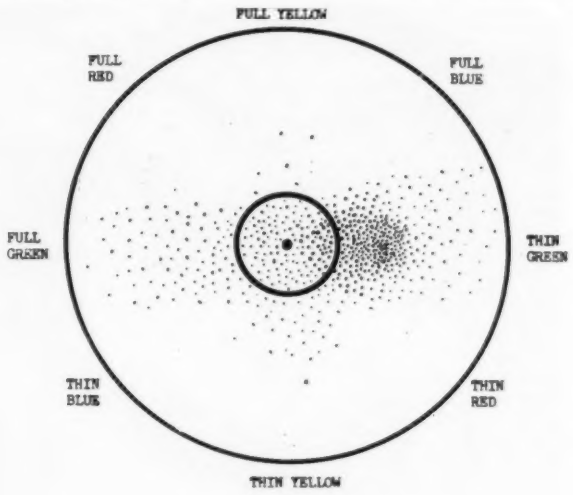

Figure 5

Scatter of results in production of OD 33 serge showing skewing

sources of effective solution. National Research Council and Industry Advisory Committees advising the Quartermaster Corps in the development of dye formulations have been particularly cognizant of the importance and encouraging of studies in this area and have served as a channel through which the requirements and information on methods of compliance have funneled to the industry as a whole.

The concept of the standard dye formulation with which the reference shade sample is produced took hold with the successes of the OD-33 shade. It has now become so well entrenched that today the idea of a standard formulation needs only the suggestion that the standard sample is dyed therewith and further that the standard also represents the level of quality that is acceptable.

D) STANDARD AS REFERENCE FOR COLORFASTNESS——With the standard formulation as an accepted principle, a further area of improvement became evident. For years, colorfastness requirements were defined in terms of "good", "fair" and "poor". Instead, the standard reference sample dyed with a standard formulation could now become the reference for those requirements. Thus the present-day specification of colorfastness, at least "equal to the standard shade sample" issued in connection with a procurement, provides for a more objective basis of acceptance, but at the same time allows for as high a quality above the minimum as can be achieved economically and competitively.

E) SHADE TOLERANCE STUDIES——

1) *General Considerations—Tolerances for Shade Control Based on Production.* A further study undertaken as part of the broad plan was to assess the extent of the variation in shade which could be considered as complying with the specification phrases "match the standard sample" and "conform to the submitted shade standard". For years these variations or tolerances were selected from the product of industry. The selections were the best considered judgment of the technologist and represented his interpretation of two contributory factors:

1) The requirements as stated in military regulations and interpreted by staff officers.

2) An assessment of the basic technological and economic capabilities of the industry.

Let us for a moment examine these two parameters and see in what way tolerance selection is affected. End-use requirements are necessarily different for dress items than for accoutrements which contrast or for such items as linings. Obviously, the most severe problems are with dress items where tolerances must be close. For the less-stringent situations of secondary shades and materials, the tolerances can be "commercial". Within these considerations, there are factors of color preference (*8*) which oftentimes dictate skewing of the tolerance in one direction or another. Other factors that cause skewing are those of color contrast and color constancy, which have been discussed at length by Katona (*9*) and by Judd and Helson (*10*), and hue, saturation and lightness properties of surfaces as influenced by chromatic illumination as reported by Judd (*11*), by Helson (*12*), and Helson and Jeffers (*13*), in particular.

In an effort to equate these various factors, studies were undertaken with a specially designed viewing box (*14*) to attempt a better definition of the tolerances in terms of appearance at the usual troop-reviewing distances, but the results did not contribute to an improvement in the spacing of tolerances because the decision was still completely subjective.

The ingredients of the second of the two parameters in the selection of tolerances are the specific properties of the dye formulations (such as intrinsic colorfastness properties, the relative rates of exhaustion of the individual dyes, interaction between dyes and the fiber, the influence of dyebath additives and contaminants, and rate of dyeing); the degree of control exercised in the preparation of the textile material for dyeing; and finally, the dyeing and finishing conditions that, at any one time and situation, might be related to the technical proficiency of the applying group, plant modernization and even economic factors.

In the mass, these influences find expression in the scatter of the acceptances in relation to theory. If we use a target as illustrated in Figure 4, we see a degree of skewing gen-

erally expected from an individual performer rather than from many. When a number of performers show the same skewing, we can look to other than individual characteristics and must examine the circumstances under which the scatter of results has been obtained. Figure 5 gives the results obtained under the contracts of one procurement of OD-33 serge.

Although the definition of tolerance spacing around a circular boundary is an unrealistic representation of color space, it can be seen that the dominant tendency of the production was to the green side. This is shown somewhat better in Figure 6. There are reasons for this skewing, which in this case were primarily related to the properties of the dyes and to some degree to the nature of industry's efforts to counteract these properties.

A similar situation has existed with the Army Green 44 shade. One ingredient of the formulation which was initially suggested by the Government, and has been used by the industry, tends to shift color to the blue with heat treatment. This fact is unquestionably responsible for the tendency of the shade to skew in the blue direction. The importance of data of this type is two-fold. They may influence the tolerances which are established, or they may prescribe counter-measures to balance the tendency of the formulation to go in the certain direction. In the latter instance, in due course, shades are produced that require further adjustment in the permissible tolerance range. Both of these actions are usually encountered.

Thus, under a selective scheme using the production of industry as source for the tolerances, a tolerance range is in a dynamic state of constant change as materials are submitted that in fairness cannot be excluded. Eventually, such a procedure leads to more or less stabilized limits but these cannot be achieved without compromises and problems for both parties to a contract over an extended period of time.

2) *General Considerations—Tolerances Developed by Scientific Methods.* It soon became obvious that to overcome this constant shifting, better spaced limits must be established that first of all would represent minimum military needs and simultaneously be within the range of commercial feasibility. The principle of the standard formulation already accepted for producing the shade standard made the approach

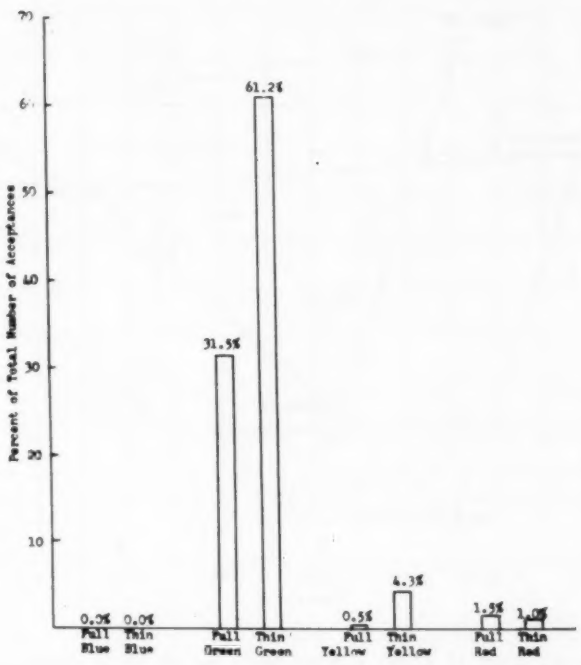

Figure 6

Frequency distribution of samples of OD-33 accepted by visual color matching against standard and tolerances

attractive and possible. The avenue of approach was obviously by means of colorimetry (*15*). This inspired the further hope that eventually color and colorfastness properties might be measurable by instrumental techniques and provided added stimulus to attempts to adapt colorimetry to Quartermaster problems.

When this decision was made, there already existed the tools requisite to the measurement and calculation of "scientifically" spaced tolerances, that can adequately and symmetrically encompass a standard. First of all in 1931, the International Commission on Illumination (the CIE) had standardized three primary illuminants and defined a standard observer for which color mixture functions were established.

This made it possible to define color in terms of the amounts of the three primary stimuli that together provide a match to it. Judd (*16*) published the details of this historical development and excellent presentations of the subject are found in publications by Hardy (*17*), the Colorimetry Committee of the Optical Society of America (*18*), Wright (*19*), Judd (*20*), and others.

Hardy's (*21*) development of the recording spectrophotometer and the more recent addition of an automatic integrator developed by Davidson & Imm (*22*) has eased the problem of measurement. Nevertheless, there are still sensitivity, precision and other problems, particularly with dark shades, such as many of those used by the military. Park (*23*) has reported on this aspect of the subject as have Shipley and Walker (*24*). Other spectrophotometers and a number of tristimulus filter colorimeters, starting with that by Hunter (*25*) in 1940, have been devised, but these are subject to many deficiencies which limit the degree of precision and accuracy sought.

Complex as are the colorimetric problems of solid piece-dyed shades (*26*), the more significant for military purposes are the fiber blend shades that go primarily into dress and service clothing. Here, however, the findings of Duntley (*27*), and Noechel and Stearns (*28*), can be adapted with modifications of varying degree depending upon the specific case at hand.

The definition of color tolerances has also received much attention by Balinkin (*29*), MacAdam (*30*), Nickerson (*31*), Nutting (*32*), Judd (*33*), Davidson (*34*), and others. MacAdam (*35*) has studied the problem of visual sensitivities to color differences in daylight and the maximum visual efficiency possible with colored materials. Davidson (*36*) has reported

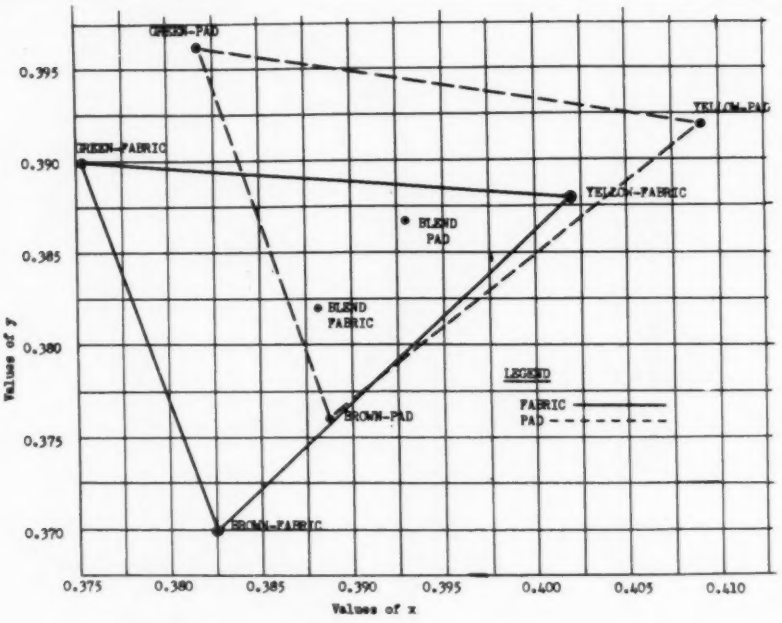

Figure 7

Selective placement of Abbott pad and fabric for OD 33 in chromaticity plane

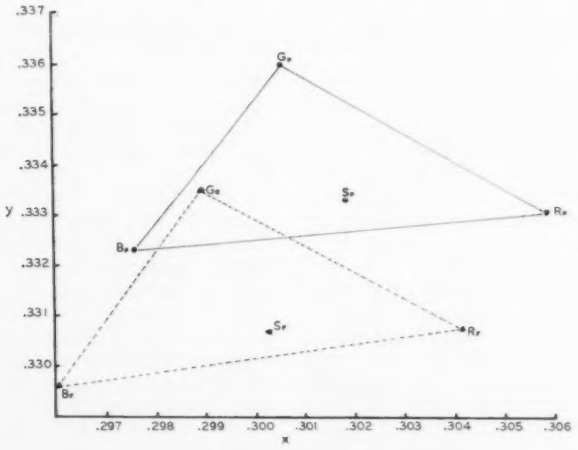

Figure 8

Selective placement of Abbott pad and fabric for AG 44 in chromaticity plane

on this also. More recently Wyszecki (*37*) has given attention to the reasons behind the visual lightness differences apparent among colored objects of colorimetrically equal lightness and varying hue. Much work has gone into color-difference formulations by investigators such as Judd (*33*), Nickerson (*38*), and others Transformations of CIE color space in the direction of uniform chromaticity scales and simplified calculations have been a constant source of study (*39*).

Accordingly, in approaching the problem of color tolerance, there are many plus and, unfortunately, a great many minus values. The plus values lie in an abundant literature. The minuses are to be found in the limitations of the available measuring instruments and the methods of sampling, differences in the illumination and viewing conditions between the instrumentation and visual practice, factors inherent in the physical state of the experimental materials, a serious need to adequately assess the contribution of processing factors, and the physical relationship between fiber and dye in the textile system.

Equipment-wise, the limitations of existing devices derive from one or more of the following factors: lack of sensitivity and accuracy, particularly with dark shades; sensitivity to metamerism, gloss and texture; smallness of the area viewed that permits disproportionate effects from the variations in surface composition or properties of the materials being evaluated, which, contrary to general practice are not necessarily overcome by spinning the sample during the measurement; and the color temperature of the illuminant used, or mathematically adjusted to, which exclusively has been lower than both the 7500°K defined in the fabric specification and the values of north sky daylight generally used by dyers in the mills. In addition, if filter-photocell systems are used, there are circuit instabilities, aberrations in the fit of the filters to the theoretical functions of the standard observer, temperature sensitivities, fluctuations and fatigue in photosensitive response and other problems. Some of the factors are instrumental by default. These relate to those parameters of visual practice, as discussed by Helson (*40*) and others, that are affected by background reflectance and intensity of illumination. Evans (*41*) covers this and related subjects in a most interesting manner.

On the material side itself, the factors are numerous. With fiber blends, which constitute the more complex case, there are problems in reproducing the surface characteristics of Abbott pads or other materials that may be used in the early stages of the predictive process for the spacing of tolerances (this is particularly true with blends of dissimilar fibers). Then there are the effects of manufacturing processes, particularly the spinning operation; the impact of chemicals used in the finishing process, some of which tend to have selective solvent or suspending power; and finally, the impact of the dry finishing processes used.

To illustrate, in Figures 7 and 8, the shifts from Abbott pad to finished fabric for OD 33 and Army Green 44 are recorded.

Some idea of the effect of the dry finishing processes (shearing, decating and pressing) can be seen in Figures 9 and 10, where are recorded the shifts that occur when the cloth is sponged and then refinished. The degree of finish attained has obviously not duplicated the original finish. This could possibly be due to instability of the dye or to chemical changes in the substrate.

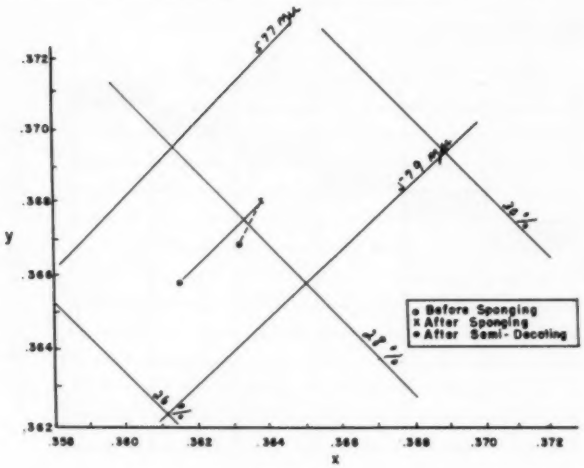

Figure 9
Shift in shade for OD 33 serge between completely finished fabric, sponged, and refinished state

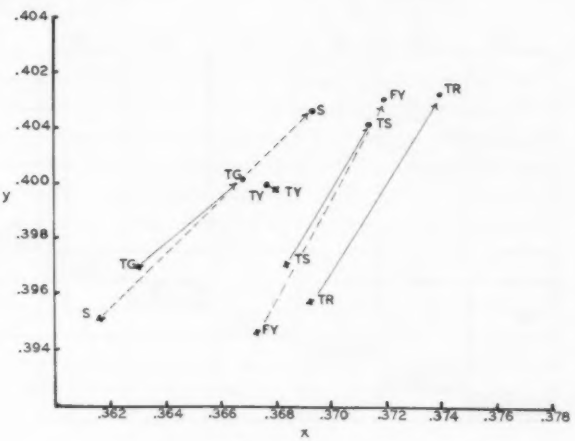

Figure 10
Shift in shade of OG 108 shirting between completely finished fabric and sponged state

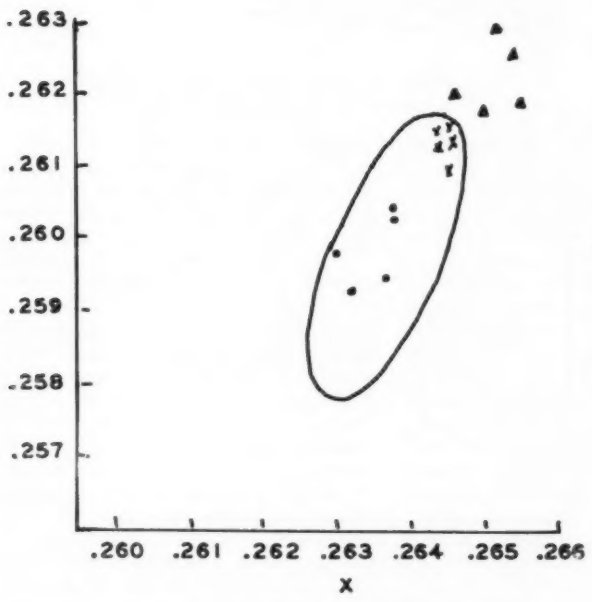

Figure 11
Chromaticity of five pieces of standard for Blue 84, as received (●), after sponging (▲), and after repressing (X)

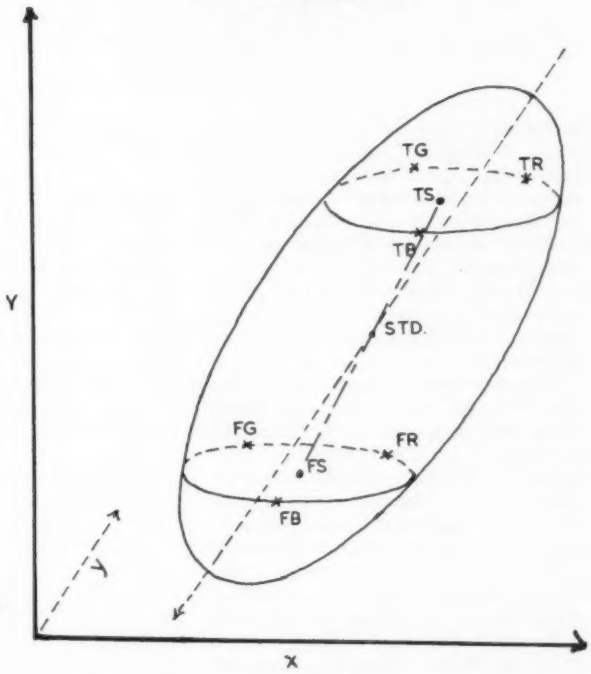

Figure 12
Tridimensional spacing of tolerances about a shade standard

Figure 11 shows the same type of information for predictions for Air Force Blue 84. These, then, define not only the problems, but the limiting factors.

Until new instrumentation recently designed and developed to do the Quartermaster job effectively has been tested and proven, available instrumentation must be used to support visual judgment and not for absolute measurement in the development of tolerances or in routine color measurement.

In talking of color, it is well to recognize that it has tridimensional attributes. It occupies a volume in space; that is to say, a color can vary in lightness or depth, it can vary chromatically (ie, it can go red, blue, green, yellow, etc), and it can change in saturation or purity (ie, it can become dull or bright). Accordingly, color tolerance spacing must also occupy a tridimensional configuration, as shown in Figure 12.

In consequence, provision must be made in tolerance spacing for all degrees of deviation. The major problem before the technologist is how much to weight each of the parameters in arriving at a definition of a tolerance range.

3) *Practical Aspects of Shade Standardization.* Now let us look at the procedure developed for the practical application of these factors to the Quartermaster control of shade and tolerance spacing. The first step is to determine at constant hue and saturation the acceptable deviation

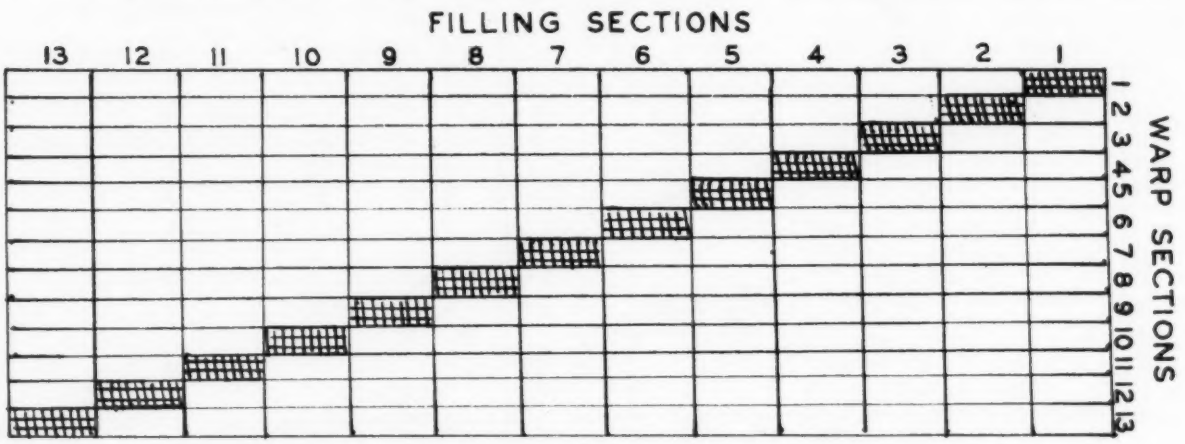

Figure 13

Typical shade blanket used in standard and tolerances development of military shades

Section

1-1 Blue Primary
2-2 Yellow Primary
3-3 Red Primary
4-4 Standard Prediction #1
5-5 Standard Prediction #2
6-6 Thin Standard Tolerance Prediction
7-7 Thin Blue Tolerance Prediction
8-8 Thin Yellow Tolerance Prediction
9-9 Thin Red Tolerance Prediction
10-10 Full Standard Tolerance Prediction
11-11 Full Blue Tolerance Prediction
12-12 Full Yellow Tolerance Prediction
13-13 Full Red Tolerance Prediction

in lightness (in textile parlance, the depth of shade.) This is still a subjective factor, and frankly, there appears to be no alternative since it is visual inspection that, in the final analysis, will accept or reject the results obtained. There is a partial control through the levels of total color difference that prior experience indicates are permissible for the specific end use.

Once the leveis of lightness for the thin and full levels are established, equal hue and saturation shifts are calculated. (See Figure 12). From these calculations result the primaries which are dyed for the actual blending of the tolerance range. This is then followed by a determination of reproducibility factors under controlled conditions and the effects of variations in processing detail, time cycles and of finish. Having obtained all of this information and integrated the findings into the initial predictions of the primaries for fiber blends (or of base shades for piece-dyed fabrics), the preliminary spacing of the tolerances becomes possible.

The practice for piece dyes has been to dye base shades lighter than and "on tone" with the "thin standard" and "full standard" level, and then overdye to achieve the specific tolerances desired. In these overdyeing operations, not only must the anticipated variations be achieved but also the letdown in shade due to dyebath interactions and the anticipated changes in subsequent processing must be balanced out to insure successful spacing out of the tolerances. Functional finishes are particularly of concern and, in cases, pose real problems in shade control. When such finishes are required one must answer the question, "at what point should the shade match?" In general, the answer is "in the completely finished form when the finish being applied is of a permanent type." Specific deviations from this procedure are made when the finish is nonpermanent and will be removed in the initial cleaning of the end item.

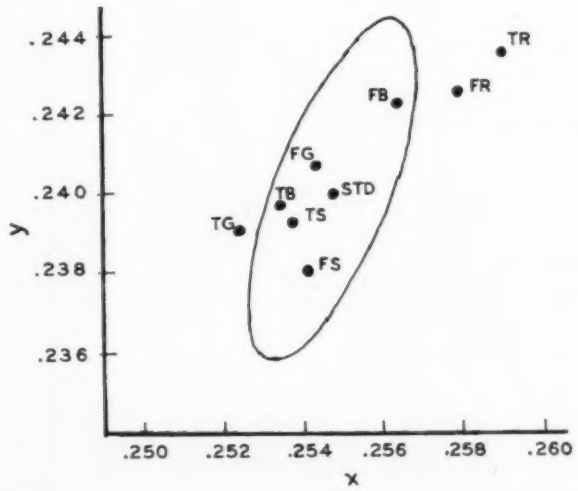

Figure 14

Spacing of shade tolerances about standard for Blue 85—chromaticity plane

With fiber-blend shades, the preliminary spacing of the tolerance range is only a start. To assure end results, plant factors must be assessed. To this end, shade blankets are utilized. (See Figure 13). The primaries as well as predictions for a standard and for each of the tolerances are included. By making the necessary adjustments indicated by the data resulting from these blankets, and with control of the processing to the ultimate possible, the final development of the tolerance range becomes possible.

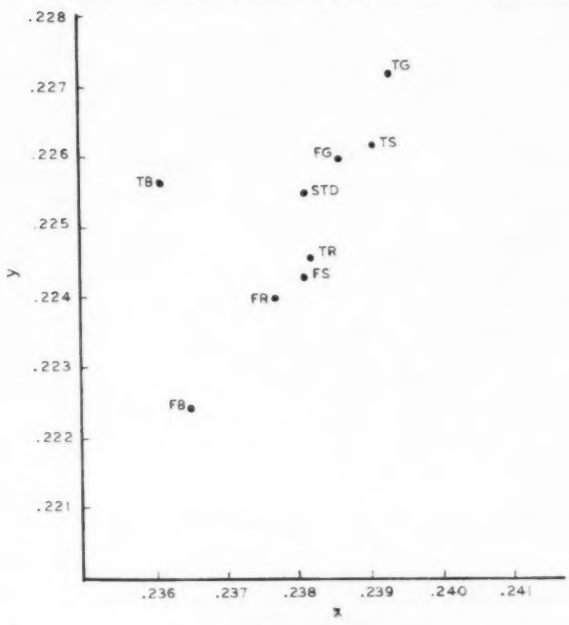

Figure 15

Spacing in chromaticity plane of tolerances for Army Blue 151 about standard

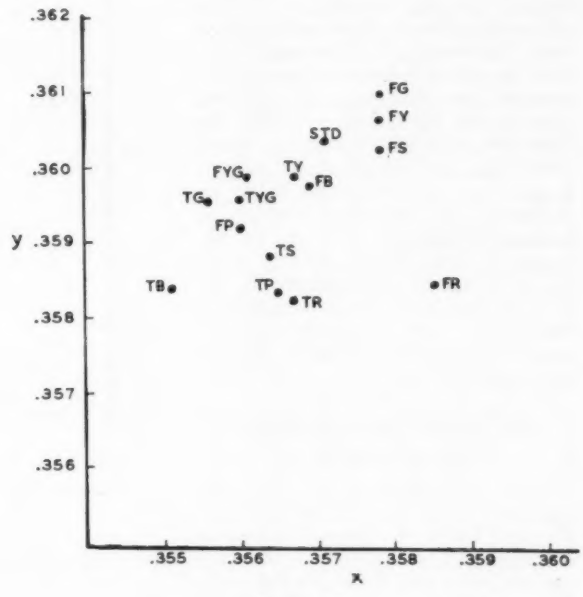

Figure 16

Spacing in chromaticity plane of tolerances for Army Tan M-1 about standard

These procedures have produced spaced tolerances of a large number of shades which visually appear to be well balanced. Colorimetric data on particular shades are shown in Figures 14, 15, and 16.

These figures show that, colorimetrically, they leave much to be desired and do not illustrate the visually apparent spacing. With fiber blends one is led to suspect interactions between the primaries, that is, that there are subtractive as well as additive factors operating in fiber blends where the primary colors are relatively closely allied by virtue of both formulation and closeness of spacing or that the theory falls down with shades of low purity and low degrees of lightness. However, the same is experienced with piece-dyed shades. Figure 17 illustrates how well the theory is met hue-wise when three widely spaced primaries of rather high saturation, dyed with different dye formulations, are blended in various ways. However, these same blends result in the lightness changes shown in Figure 18. These changes do not appear to be accounted for by existing theory. Figures 19 and 20 illustrate the same type of data for two military shades, one light, one dark. There are aberrations in both hue and lightness functions in both of these shades.

There is no doubt that some of the problems are instrumental and some are due to the surface properties of the fiber blend pads used, but it is equally apparent that much of what is seen is not accounted for by existing theory. In many respects, the machine reproducibility is in the range of the average military tolerance; the human eye by its integrating function may weight surface factors more reasonably than the machine, but these are not enough to answer the problem.

In a way, these apparent deviations from theory must basically be an expression of the differences in the manner that a mixture of three primary light sources interact to produce a uniform field (this was the basis of the CIE functions) as compared with a mixture of three colored fibers that result in a microscopically inhomogeneous system. This latter system must be capable of secondary optical interactions not present in the first. Thus, considerably more work needs to be done with fiber blends and with the theory as a whole before definitive tolerance predictions of the degree necessary for military use can be achieved without the use of unexplained factors.

There are special problems peculiar

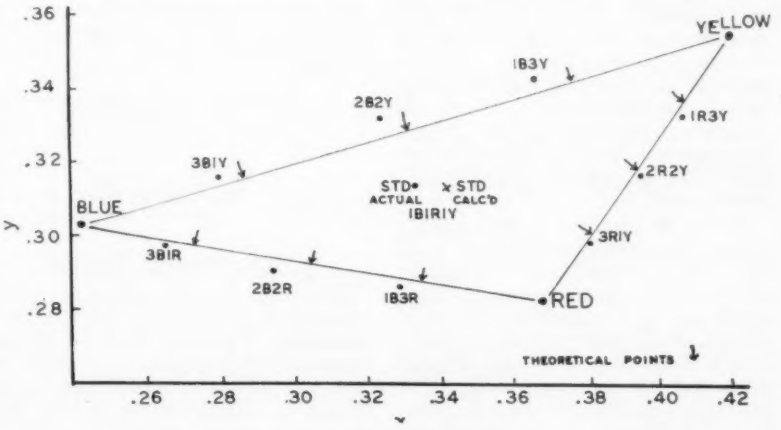

Figure 17

Placement of blends of three widely different primary shades (Abbott pads) in chromaticity plane

to the synthetic fibers because of luster, specific orientation within yarns, translucency and sensitivity to small differences in processing factors. In addition, heat treatments appear to alter shade due to improved distribution of the dye within the fiber after the heat treatment. These fibers thus call for a change in procedure if reproducibility is to be achieved. In particular, it must be recognized that the blend can be determined with assurance only after the color has been stabilized. To assure control, this should be achieved before the fiber is blended and certainly before color-altering processes are applied.

RECAPITULATION AND CONCLUSIONS

Thus in the field of tolerance development it cannot yet be said that the ideal has been attained. There is still too much of the subjective in the choices made and some instability in the measurement systems which preclude an immediate solution.

In retrospect, the problems of shade control for U S Army clothing items have taken a definite pattern of development since the post-war years. Color-matching conditions have been stabilized; standard formulations have been adopted which are used for the preparation of the standard shade sample issued in connection with procurements, and these standards are established at a level which reflects the minimum which is acceptable with respect to colorfastness in relation to projected use; a serious effort has been made to round out tolerance ranges so that they reflect adequately the ultimate requirements of the military and with due cognizance of established capabilities of the industry. This work has been supplemented and complemented by a large number of studies into those parameters of dyeing and finishing operations contributing to the deviations which are generally the subject of discussion between the Government and the industry when rejections occur.

As for the future, further refinements of existing techniques may be expected. This will include a genuine effort to utilize instrumentation to the maximum degree possible; however, the standard shade sample of reference will be continued and physical tolerances will be available for visual review even though mathematical representations of color may be available and instrumental techniques prescribed for their determination.

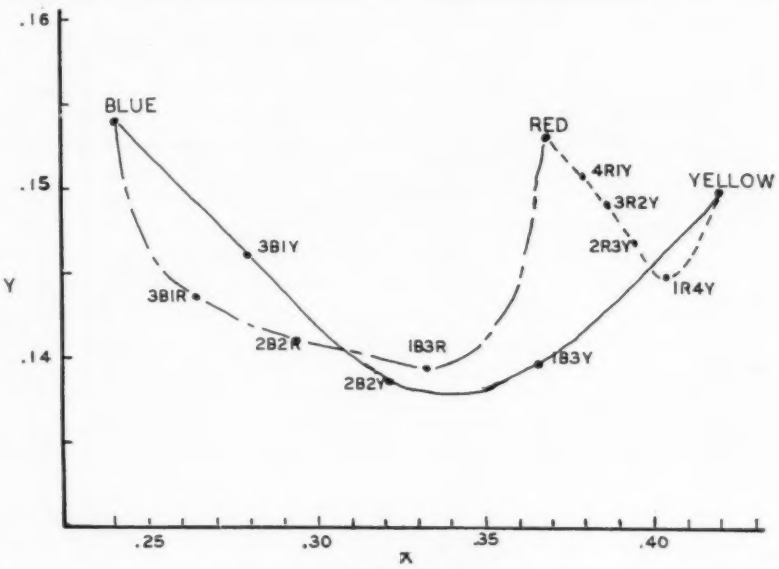

Figure 18
Placement of three widely separated shade primaries and blends in color space—lightness plane

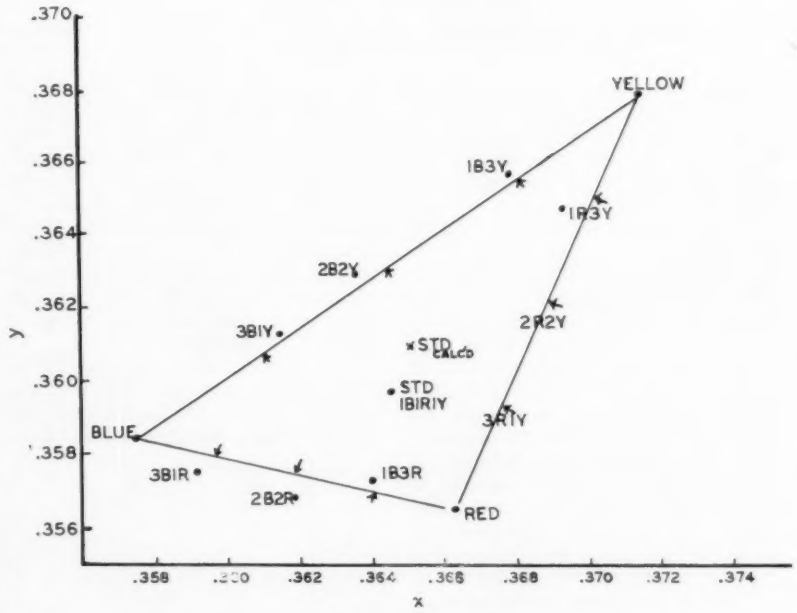

Figure 19
Placement of blends of three primaries of Army Tan M-1 in chromaticity plane (Abbott pads)

ACKNOWLEDGMENT

This paper has benefitted from the support of a number of the author's associates. Particular mention should be made to the assistance of Alvin O Ramsley of the author's staff, who helped in setting up the figures and who performed most of the colorimetric determinations reported. Constantine J Megas, also of the author's staff at the Quartermaster Research and Engineering Center, has been very close to the subject since the very early days of the program and has contributed significantly to much of the work reported.

The paper had the critical review of Dr Stephen J Kennedy, chief, Textile Clothing and Footwear Division and the author's immediate superior. Dr

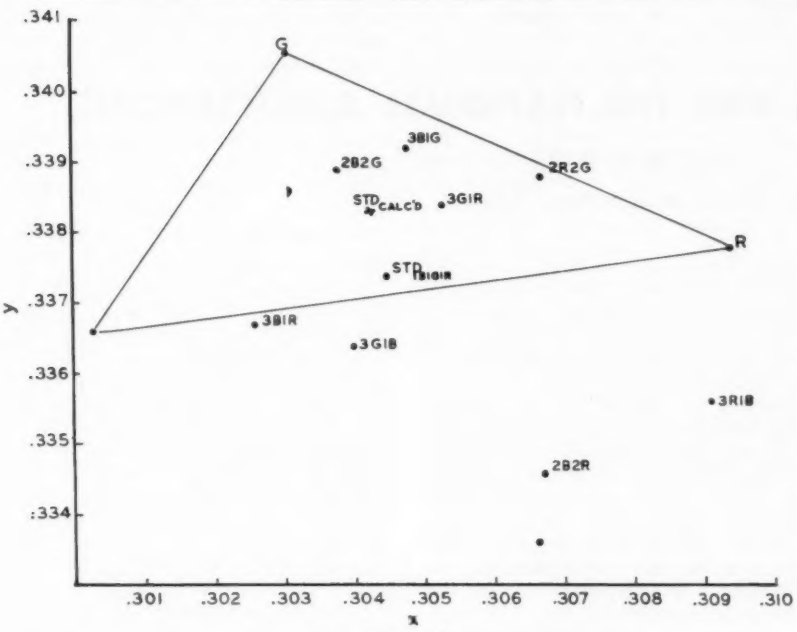

Figure 20

Placement of blends of primaries (Abbott pads) for AC 44 shade in chromaticity plane

Kennedy's contact with the problems mentioned actually goes back to the days before the author became involved, when the situations were arising, which led to the initiation of a dyeing and finishing program by the Quartermaster Corps. The program has had his personal review and guidance from the start. The paper was edited by Mrs Saidee Ross, Technical Services Office.

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AATCC Calendar

COUNCIL
Apr 20-21 (Jack Tar Hotel, Durham, NC); April 20—Council Committees and Research Committees; April 21—(AM) Council Committees and Research Committees, TCR luncheon, TCR (PM), Nominating Committee (5 PM), Council (8 PM)
Sept 26 (Statler Hotel, Buffalo, NY); Council (8 PM)
Nov 17 (Hotel Sherman, Chicago, Ill); Council and Annual Meeting (2 PM)
Jan 26 (Hotel Commodore, New York, NY); Council (10 AM)

NATIONAL CONVENTIONS
Sept 27-29, 1961 (Hotel Statler, Buffalo, NY); 1962 (Atlanta Biltmore Hotel, Atlanta, Ga); 1963—Boston; 1964—New York; 1965 (Conrad Hilton Hotel, Chicago, Ill)

DELAWARE VALLEY SECTION
Apr 14 (Ladies Night—Cherry Hill Inn, Haddonfield, NJ); May 19 (Outing—North Hills CC, North Hills, Pa); Sept 15 (Wilmington, Del); Oct 27 (Beck's); Dec 1 (Beck's)

HUDSON-MOHAWK SECTION
Apr 14 (Waterford, NY—plant tour of General Electric Co's Silicone Div); May 12 (Ladies Night); June 23 (Outing—Antlers Club, Amsterdam, NY)

METROPOLITAN SECTION
Mar 24 (Kohler's Swiss Chalet, Rochelle Park, NJ—"Market Opportunities for Color"—Arthur N Adlman, Werner Textile Consultants); April 21 (Kohler's Swiss Chalet, Rochelle Park, NJ—"Importance of Bow and Skew"—Lucille Rea, Simplicity Patterns, and John Robertson, Mt Hope Machine Co); May 19—(Kohler's Swiss Chalet, Rochelle Park, NJ—Ladies Night).

MID-WEST SECTION
April 15 (Schroeder Hotel, Milwaukee, Wis); June 24 (Annual Outing—Cerami's Island View Resort, Burlington, Wis); Nov 18 (Chicago, Ill)

NIAGARA FRONTIER SECTION
Apr 7 (Joint meeting with Ontario Section, CATCC, St Catherines, Ont); May 18 (Buffalo, NY)

NORTHERN NEW ENGLAND SECTION
Mar 24 (Colonial Country Club, Lynnfield, Mass); May 5-6 (New England Regional Meeting, Jug End Barn, S Egremont, Mass); Sept 8 (Annual Outing); Oct 20 (Quartermaster R & E Command, Natick, Mass); Dec 18 (Motel 128, Dedham, Mass); Jan 19 (Woodlawn Country Club, Newton, Mass)

PACIFIC NORTHWEST SECTION
Mar 31; May 26; Aug 5 (annual outing); Nov 10 (business meeting)

PACIFIC SOUTHWEST SECTION
May 19, Sept 30 (outing), Nov 17

PALMETTO SECTION
Apr 15-16 (Richmond Hotel, Augusta, Ga); June 8-10 (joint outing with Piedmont Section at Grove Park Inn, Asheville, NC); Sept 15-16 (Clemson House, Clemson, SC); Jan 20-21 (Poinsett Hotel, Greenville, SC); April 14-15, 1962 (Francis Marion Hotel, Charleston, SC)

PIEDMONT SECTION
April 22 (Jack Tar Hotel, Durham, NC); June 9-10 (Outing, Grove Park Inn, Asheville, NC); Sept 23 (Hotel Charlotte, Charlotte, NC)

RHODE ISLAND SECTION
Mar 24 (Dinner Meeting); May 5-6 (New England Regional Meeting, Jug End Barn, South Egremont, Mass); June 23 (Outing); Sept 15 (Management Meeting); Oct 27 (Dinner Meeting); Dec 1 (Annual Business Meeting)

SOUTH CENTRAL SECTION
Apr 15 (Hotel Patten); June 16-17 (Summer Outing—Riverside Hotel); Sept (Hotel Patten—tentative)

SOUTHEASTERN SECTION
Apr 8 (Atlanta Athletic Club, Atlanta, Ga); June 9-10 (Summer Outing, Radium Springs, Albany, Ga); Sept 9 (Ida Cason Gardens, Pine Mountain, Ga); Dec 2 (Atlanta Athletic Club, Atlanta, Ga)

WESTERN NEW ENGLAND SECTION
May 5-6 (New England Regional Meeting, Jug End Barn, S Egremont, Mass); May 19 (Ladies Night—Rapp's Paradise Inn); June 9 (Annual Outing); Sept 15 (Plant visitation); Oct 27 (Annual Meeting); Dec 1 (Shelton, Conn)

South Central Section———

AATCC SECTIONS AND THE NATIONAL ASSOCIATION*

GEORGE P PAINE
Executive Secretary, AATCC

WHEN I was invited to be on your program today, I was asked to discuss the relationship of AATCC Sections to the national body. I am very glad to have had this topic selected for me, since I have observed that this relationship is not clear to many AATCC members. Because each of you holds a dual membership in AATCC, namely, as a member of your section and as a member of the national organization, this subject is probably one of some interest to all of you.

Before we can go very far with this discussion, we should define some of the things we are going to talk about. So, first, suppose we look at the Association at the section level, and then put all the Sections together into a national technical society. Let's take the South Central Section as an example.

Here is a group of individuals, joined together with a common purpose, which has its own officers, its own committees, its own treasury, its own governing machinery, its own customs, traditions and ways of doing things. It is a self-contained, autonomous body, affiliated with 15 other sections thoughout the United States, each one of which is the very heart and soul of AATCC. Without these sections, there would be no AATCC.

While the prerogatives and privileges of self-sufficiency, self-expression and self-determination are inherent in all sections, there are cetain characteristics which make one Section different from another. A section takes on the personality of its members and often reflects their professional and occupational interests, their geographical location and their historical background in AATCC affairs.

Several weeks ago, we made an occupational analysis of the Association, section by section. The results of this study reveal some very interesting and useful information. Yours is a "mill" section. Your neighbor, the Southeastern Section, has almost as many members in technical service and sales as there are chemists and dyers and finishers combined. These differences are important in order that the national organization can pinpoint its services to meet the varying interests of the sections.

Geography also plays a part in shaping the personality of a section. A week-end meeting to which some of you come great distances is entirely different in its atmosphere from a Friday evening meeting such as the Metropolitan Section holds with a dinner and evening program. Yet each serves the convenience and the wishes of the members of the sections concerned.

Historically, too, the experience you have gained over the years in administering your section has contributed to the wise solutions of problems as they arise, as you continue to grow in members and in influence on the national scene.

The other day, I looked back into the bound set of *American Dyestuff Reporters* I have in my office—back to the 1927 issues, which reported the founding of the South Central Section. What you went through then is similar to what has happened with the formation of the new Palmetto Section in South Carolina and the Northern Piedmont Section in lower Virginia and northern North Carolina. As most of your members know, South Central was born of a split of the then-called Southern Section, which covered all territory south of Washington, DC. On April 30, 1927 at the Patten Hotel right here in Chattanooga, the Southern Section gave way to the new Piedmont and South Central Sections. The record states this was done because of the great distances which had to be travelled to attend meetings, and this was one of the reasons for the new sections recently formed in the Piedmont territory. Four years later the Southeastern Section was organized in South Central territory, and when that happened, your membership was reduced from 64 to 26, less by about half of what it was when you started. However, size did not seem to deter this Section from taking on the second AATCC Convention to be held in the South only three years after its formation.

At this point, having seen a section functioning all by itself and running its own show, we might ask the question—why a national body? The national body is more intangible than the sections, and for that reason, it may be more difficult to define. Figuratively speaking, it serves as an umbrella, providing a coverage of service to the members of the sections which no single section could undertake on its own. For example, the national organization provides for extensive information services.

Every other Monday, an issue of *American Dyestuff Reporter*, which carries as a special section the *Proceedings* of the Association, comes off the press and is mailed to our 7,500 members in this and 42 other countries around the world, and to approximately 2,500 additional readers in the textile wet-processing industry. The *Proceedings* carry technical articles and reports in your field of professional interest and accounts of your Section's activities. The *Technical Manual*, a 700-page publication of six volumes in one, is sent to you each year. Each member of your Section receives these two major publications as part of his national membership service for only $10 a year dues.

We shouldn't take these publications for granted, for these, probably more than anything else except section meetings, reflect the image of AATCC. They furnish a wealth of information essential in one way or another to your daily tasks. In the *Technical Manual* alone, you find all the AATCC Test Methods, recognized universally as the authority in textile testing. There is an up-to-date list of American-made dyes and textile chemical specialties, a bibliography, committee reports, information about the Association including sections, and an address list of the business and home of every AATCC member—especially valuable when addressing Christmas cards!

The national body, in addition to communicating information through its publications, furnishes to the members of all Sections a means of

*Presented before the South Central Section at Chattanooga, Tenn, February 18, 1961.

obtaining and exchanging information through personal contact and through the more formal channels of national committees and conventions.

In order to provide for these and other services, there must be an organized framework, and this is where AATCC as a technical society operates in reverse from a corporate structure. The chain-of-command goes upward instead of downward, in that the direction is from the members, through the sections to the Council, rather than the other way around. Thus, the Council expresses the will of the Association as a whole through a completely democratic process. It is this arrangement that creates autonomy for the sections, committing the national body to serve the sections. Your own National Councilors, Joe Mosheim and John Sweitzer, are your elected representatives to the Association's governing body, but governing only to the extent of establishing policies and programs designed to serve the members and the sections. Similarly, your regional vice president, Henry Gaede, is elected by the members of the Southern Sections, now six in all, so that you have representation both at the section and regional level in national affairs. Of course, the president is elected by the membership as a whole, and in this office too, you as individuals exercise a voice.

The Council now has a membership of 64, 45 of whom are Councilors elected by sections. Stemming from the authority of the Council are over 100 administrative and research committees which carry on the day-to-day business of the Association. Several of these national committees maintain a direct relationship with the sections. The Committee on Individual Membership, the Corporate Membership Committee, the Subject and Speakers' Bureau and the Publicity Committee automatically include the corresponding section officials as ex-officio members. Your Councilors are ex-officio members of the Technical Committee on Research, which is the operating group, responsible for the national technical and research program. This enables your Councilors to report directly to you what the Association is doing and how it is progressing in the technical area of its activities.

Through your Councilors each of you has the opportunity to suggest new ideas for improving the usefulness of the national body as it benefits you as individuals and as it benefits your companies.

As you know, about 300 companies support AATCC's technical activities with corporate membership dues, and it is incumbent on the Association to see that these funds are utilized to the best advantage possible. Your opinions, originating in the section and transmitted to the national body through your representatives, can be helpful in guiding all phases of AATCC development.

Now I would like to go back to the findings of the occupational analysis of the membership, and tell you what AATCC, as a national organization, does for a living. For the purpose of this study, we took only those members who live and work in the United States, in the Senior, Junior and Associate membership classifications. (See Table I).

Briefly, the study shows that of these 6,694 members, 1,416 or 21 percent are chemists, 1,314 or 20 percent are dyers and finishers and 1,420 or 21 percent are technical service and sales personnel.

This accounts for nearly two-thirds of the membership. There are 811 corporate officers, 429 general managers and superintendents and 315 research directors and technical managers, which, as a management and supervisory group, total 1,555, and represent 23 percent of the membership. Then there are 129 educators, 118 laboratory technicians and assistants, 65 consultants and 46 in quality control leaving 631 who did not fall into any predetermined classifications. These are, for example stylists, market researchers, converters, a bacteriologist, and those with no indicated business affiliation.

These figures must now be interpreted to determine what they mean. The Executive Committee on Research is reviewing the entire research and technical program to see if it is properly oriented to the significant interests of the membership. These figures can be meaningful in other ways, such as evaluating the kind of information being disseminated and in long-range plans geared to assure compatibility of the national body's policies and programs with the membership as it is concentrated in the 16 sections. For instance, technical service and sales personnel are heavily represented in the Pacific Northwest and Southeastern Sections. Washington is a Section of chemists. You are mainly dyers and finishers. When we made this survey, your Section had 240 members. Of this number 91 are dyers and finishers; 56 are corporate officers, research directors, technical managers and general managers and superintendents; 44 are in technical services and sales; 28 are chemists and the remaining 21 are laboratory technicians and assistants, in education, in quality control, etc. We found that the Mid-West Section has more educators than any other Section—25 as against the next largest number of 16 in the Northern New England Section.

There is another arm of the national organization which is set up to serve the sections. This is the Association's Headquarters where a permanent, full-time staff is maintained. I would like you to feel that the Headquarters' office is your office and a place that each of you can contact at any time for information on any subject concerning the Association. Our staff keeps your section's secretary informed of all changes of address and company affiliations of your membership. We arrange for publication of your section's Annual Report and your list of officers in the *Technical Manual*. We furnish you with lists of your members who have overlooked paying their dues. We keep your Councilors and chairman informed of Council actions through writing up and distributing Council minutes. We furnish you with membership applications and promotional material to aid you in building your section's membership, and provide various manuals and guides to assist you in conducting the affairs of your section. "A Guide for Section Officials" is available containing a list of duties generally assumed by the chairman, vice chairman, secretary, treasurer and Councilors. You can obtain from Headquarters a "Guide for AATCC Authors and Speakers" and a manual for section publicity chairmen. In the near future, you will be able to request copies of an operating manual for AATCC conventions and a booklet containing the rules and regulations of the Intersectional Contest. This Contest has become one of the principal features of AATCC conventions and offers an opportunity to every section to utilize its professional talent in making a very real contribution to AATCC's technical and scientific output.

The Association offers placement facilities to its members, both employees and employers. This membership service functions on a year-round basis and during annual conventions. We generally find that there are more openings than applicants for employment.

TABLE I
AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS
Occupational Analysis

Regions / Sections			Chemists	Dyers & finishers	Tech service & sales	Research director & tech manager	Lab tech & assistants	Gen mgrs supt. etc	Corporate officers	Educators	Consultants	Qual control	Miscellaneous	Totals
NEW ENGLAND REG	NNE	Sr	97	80	66	22	2	26	61	12	8	2	52	428
		As	11	2	8	1	1	4	9	3	—	—	3	42
		J	6	1	—	—	2	—	—	1	—	—	1	11
		Totals	114	83	74	23	5	30	70	16	8	2	56	481
	WNE	Sr	52	47	24	11	—	12	17	—	—	4	24	191
		As	4	—	2	—	—	1	1	—	—	—	4	12
		J	—	—	—	—	—	—	—	—	—	—	—	—
		Totals	56	47	26	11	—	13	18	—	—	4	28	203
	RI	Sr	80	127	91	20	2	42	73	9	4	3	38	489
		As	29	7	29	—	—	4	9	—	—	—	4	82
		J	10	1	2	—	—	—	1	1	—	—	2	17
		Totals	119	135	122	20	2	46	83	10	4	3	44	588
CENTRAL ATLANTIC REG	MET	Sr	266	183	247	86	25	71	202	6	23	12	115	1236
		As	22	12	61	4	4	16	56	3	—	2	22	202
		J	18	3	8	—	8	1	1	—	—	—	11	50
		Totals	306	198	316	90	37	88	259	9	23	14	148	1488
	HM	Sr	33	58	12	11	—	11	13	3	2	—	17	160
		As	3	—	7	—	—	3	4	—	1	—	2	20
		J	2	1	1	—	—	1	1	—	—	—	1	7
		Totals	38	59	20	11	—	15	18	3	3	—	20	187
	NF	Sr	20	34	20	5	1	2	8	1	—	2	9	102
		As	3	—	6	—	—	1	—	1	—	—	2	13
		J	—	—	—	—	—	—	—	—	—	—	—	—
		Totals	23	34	26	5	1	3	8	2	—	2	11	115
	DV	Sr	162	159	146	51	13	43	92	10	6	2	69	753
		As	16	4	31	3	3	2	5	3	—	2	11	80
		J	12	4	2	—	2	—	—	—	1	—	4	25
		Totals	190	167	179	54	18	45	97	13	7	4	84	858
SOUTHERN REGION	PI	Sr	92	109	150	12	11	30	47	—	3	1	26	481
		As	7	7	23	—	1	3	7	1	—	—	3	52
		J	8	3	2	—	3	—	—	—	—	—	3	19
		Totals	107	119	175	12	15	33	54	1	3	1	32	552
	NPI	Sr	85	110	76	14	4	25	27	10	3	3	13	370
		As	8	3	14	—	—	3	1	—	—	—	5	34
		J	16	4	1	—	2	—	—	1	—	—	—	24
		Totals	109	117	91	14	6	28	28	11	3	3	18	428
	SC-PAL	Sr	62	68	78	14	5	38	25	1	1	3	25	320
		As	3	2	12	—	2	3	4	—	—	—	4	30
		J	14	3	2	—	4	—	—	—	—	—	9	32
		Totals	79	73	92	14	11	41	29	1	1	3	38	382
	W	Sr	42	7	7	16	2	5	7	2	2	2	24	116
		As	4	3	1	1	1	—	2	2	—	—	6	20
		J	4	—	—	—	3	—	—	—	—	—	3	10
		Totals	50	10	8	17	6	5	9	4	2	2	33	146
	SE	Sr	67	71	115	6	1	31	32	9	2	1	28	363
		As	6	5	20	—	—	3	6	5	1	—	9	55
		J	4	1	—	—	2	—	—	—	—	—	5	12
		Totals	77	77	135	6	3	34	38	14	3	1	42	430
	SCL	Sr	25	82	33	7	4	19	22	1	—	3	9	205
		As	2	5	9	1	—	2	5	—	—	1	—	25
		J	1	4	2	—	3	—	—	—	—	—	—	10
		Totals	28	91	44	8	7	21	27	1	—	4	9	240
WESTERN REGION	MW	Sr	87	61	59	19	3	15	29	17	3	2	35	330
		As	12	3	8	5	2	—	13	8	—	—	9	60
		J	1	1	3	—	—	—	—	—	—	—	2	7
		Totals	100	65	70	24	5	15	42	25	3	2	46	397
	PNW	Sr	2	11	8	—	1	6	3	3	1	—	4	39
		As	1	—	9	—	—	1	—	2	—	—	1	14
		J	—	—	1	—	—	—	—	—	—	—	—	1
		Totals	3	11	18	—	1	7	3	5	1	—	5	54
	PSW	Sr	12	26	18	4	1	3	25	9	1	1	10	110
		As	—	—	4	1	—	—	1	3	—	—	5	14
		J	1	1	—	—	—	—	—	—	—	—	—	2
		Totals	13	27	22	5	1	3	26	12	1	1	15	126
	UNCLASS	Sr	2	1	1	1	—	2	—	1	3	—	—	11
		As	2	—	1	—	—	—	2	1	—	—	1	7
		J	—	—	—	—	—	—	—	—	—	—	1	1
		Totals	4	1	2	1	—	2	2	2	3	—	2	19
TOTALS	NE Reg		289	265	222	54	7	89	171	26	12	9	128	1272
	CENT ATL Reg		557	458	541	160	56	151	382	27	33	20	263	2648
	SOUTH Reg		450	487	545	71	48	162	185	32	12	14	172	2178
	WESTERN Reg		116	103	110	29	7	25	71	42	5	3	66	577
	UNCLASS		4	1	2	1	—	2	2	2	3	—	2	19
	Grand Total		1416	1314	1420	315	118	429	811	129	65	46	631	6694

The AATCC Headquarters is the source of supply of the four-volume *Colour Index*, the Vat Dye Monograph, various reprints of technical articles, and such items as lightfastness standards, gray scales, membership lapel pins and now an AATCC emblem tie clip, which makes a nice present for any customer. I have mentioned some of the things the national body distributes free through its headquarters and some of the things it sells as a service.

The national body also helps to finance the sections through annual payments to each section of $1.50 for each Senior Member up to 601 members and from then on slightly less. This is a relationship of the sections to the national body which should not be overlooked!

I might also add that the national body does your section's income tax. While the Association enjoys a tax-free status, we must file a tax return with financial statements for the 16 sections. If the sections were to handle this, it would mean they would each have to establish themselves with the Treasury Department as tax-exempt, file their own returns and become involved in considerable paper work and red-tape.

To sum up, I would like to cite a portion of Article ten of the national bylaws. It states, "Sections of the Association shall be local groups of Association members, self-governing insofar as consistent with the Constitution and Bylaws of the Association." This concept is fundamental to the relationship of the sections to the national body.

The common purpose of the members, the sections and the national body as stated in the Constitution is "to promote increase of knowledge of the application of dyes and chemicals in the textile industry; to encourage in any practical way research work on chemical processes and materials of importance to the Textile Industry; and to establish for the members channels by which the interchange of professional knowledge among them may be increased."

These objectives broadly stated and tempered with great flexibility, provide the guidelines for achievement as a technical society, offer an incentive for greater service to our fellow members and to our industry, and give all of us a sense of pride in being members of the National AATCC and members of the sections to which we belong.

The Textile Consumer Looks to AATCC———

(*concluded from page 33*)

The third function of this department is to evaluate from the consumer's point of view every proposed change in an existing product and every new product we consider for national distribution.

In the initial years of the operation of this department these were the main functions—and then we began to see something develop that we had not anticipated. After handling an average of approximately one thousand letters a month from homemakers and consumers of our household package dye, we began to realize that here was a great wealth of information coming to us, and more and more advertising, merchandising, selling, and public relations departments began to rely on this department to tell them not only the diffence between right and wrong but to use them for a source of ideas for new uses, new ideas, and new concepts, and, more important, changes that were taking place in the habits of the consumer.

An outgrowth of this was the utilization of this department for being the primary source of literature which was eventually developed for widespread distribution, not only in terms of generally accepted merchandising methods, such as point of sale literature, but a complete program of rather large magnitude pointed to the primary schools, secondary schools, colleges and universities, home economics, and extension agents.

This department, in addition to performing these duties, has gained great stature within our company, and the director of this department today occupies a position of great trust and responsibility.

We have encouraged the consumer to tell us of her experiences. We are equally interested in the bad experiences as we are in the good experiences. Through a knowledge of their failures and an opportunity to examine the articles on which they reported failures and our opportunity to redye such failures, we have learned many things that have since been reflected and will continue to be reflected in the improvement of the quality of our product.

This is but an example of how a large organization provided a means whereby we could find out what the consumer wanted and what she expected, and whereby we could constantly attempt to achieve better results for her. Most important of all, it put our consumer relationship in the proper perspective and gave our management at all levels a far better realization as to why we were in business in the first place.

Now obviously this costs money, and I can say frankly that it costs our company a great deal of money. I would be willing to go on record as saying that, if the occasion should ever arise that we would have to retrench, this is the last place in our organization we would start. We know that it is almost impossible to measure in terms of dollars the good that this department does, but we are completely convinced that without it we would be in a most unenviable position.

Now, there are some risks that an organization takes in getting so deeply into the field of consumer relations. In one sense it is not easy to attempt to translate technical skill and knowledge into the printed word in attempting to influence consumers or translate technical and scientific skill into a product for use by the unskilled. Sometimes we learn things that are not pleasant. Sometimes we learn things that cause us a great deal of concern, but it is only through these contacts we have with our consumers through this department we feel that we can really make progress.

It certainly causes us to do objective thinking.

Whether or not AATCC will ever establish a committee for consumer's interests, I do not know. I do know that the matter will be most thoroughly discussed and talked about in both the Executive Committee and the Council, and I am sure that the decision that will be reached will be for the good of the Association and the textile industry.

Thank you all very much for your courteous attention.

Membership Applications

February 16 - March 1, 1961

NEW ENGLAND REGION

Western New England Section

Transfer to Junior

Bruce R Richmond—Res & dev chemist, Armstrong Rubber Co, West Haven, Conn. Sponsors: G J Mandikos, G M Kidder.

CENTRAL ATLANTIC REGION

Delaware Valley Section

Senior

Robert J McLaughlin—Staff mgr, commercial dev dept, Pittsburgh, Plate Glass Co, Paint Div, Pittsburgh, Pa. Sponsors: R R Currier, H A Stauderman.

William R Taffe—Production expeditor, Globe Dye Works Co, Philadelphia, Pa. Sponsors: F V Traut, E F Martin.

Metropolitan Section

Senior

Leonard Fox—Dev chemist, textiles, National Starch & Chem Corp, Plainfield, NJ. Sponsors: G E Lanciault, H C Olsen.

Robert U Frondorf—Vice pres, Ault & Wiborg Co (Far East), subsidiary, Interchemical Corp, Manila, Philippines. Sponsors: A H Siepert, S Meeker.

Morton G Mack — Plant owner, Superba Print Works Inc, Paterson, NJ. Sponsors: C G Germanetti, H Sandler.

Edward L Patton—Chemist, Shell Chemical Co, Union, NJ. Sponsors: G R Ferrante, R J Cullen.

Junior

Jack G Irving—Laboratory technician, Sandoz Inc, Chemical Div, New York, NY. Sponsors: R Akyuz, A V Finn.

Associate

John J Buckley—Salesman, Nyanza Color & Chem Co, New York, NY.

SOUTHERN REGION

Palmetto Section

Senior

Warren E Baker—Tech & new dev dept, Clearwater Finishing Co, Clearwater, SC. Sponsors: W F Thompson, J Dabrowski.

Transfer to Junior

John R Newell Jr—Production trainee, Riegel Textile Corp, Ware Shoals, SC. Sponsors: S M Thomson, J H O'Neill.

South Central Section

Associate

Fred H Macnamara — Salesman, Chapman Chem Co, Memphis, Tenn.

Southeastern Section

Senior

Lee A Enberg—Dist mgr, McKesson & Robbins Inc, Chemicals Dept, Atlanta, Ga. Sponsors: W F Crowell Jr, R M Jones.

James P Nichols—Senior foreman, piece dye, Reeves Bros Co Inc, Eagle & Phenix Finishing Div, Columbus, Ga. Sponsors: L Tigler, T Sutterfield.

James D McAfee—Overseer of dyeing , J P Stevens & Co Inc, Milledgeville plant, Milledgeville, Ga. Sponsors: H L Thomas, G M Kidder.

Edward W Samoden—Vice pres, sales, Chem-Salts Inc, Atlanta, Ga. Sponsors: W F Kennady, E R Hansen.

Junior

Robert H Coley—Lab technician, Eagle & Phenix Div, Columbus, Ga. Sponsors: L Tigler, H J Gambert.

Washington Section

Student

Gordon H Broome—Chemist, analytical, American & Efird Mills Inc, Mount Holly, NC. Sponsor: W H Martin.

WESTERN REGION

Mid-West Section

Senior

Kenneth E Peterson—Tech service work, Minnesota Mining & Mfg Co, St Paul, Minn. Sponsors: H G Bryce, E J Grajeck.

Associate

Howard K Elder—Production mgr, The Joseph M Stern Co, Cleveland, O.

Pacific Southwest Section

Senior

Frank P Celiberti—Tech sales rep, Naugatuck Chem Div, U S Rubber Co, Los Angeles, Calif. Sponsors: N P Chlores, G J Mandikos.

Associate

Philip B Manasse—Supt, Sawyer Tanning Co, Napa, Calif.

STUDENT CHAPTERS

Philadelphia College of Textiles & Science

Students

Joseph Fox—Student, Philadelphia College of Textiles and Science, Philadelphia, Pa. Sponsor: W H Hughes.

Raul J Gil—Student, Philadelphia College of Textiles & Science, Philadelphia, Pa. Sponsor: W H Hughes.

Lowell Technological Institute

Student

Abdelrahman E Fahmi—Graduate student, Lowell Tech Inst, Lowell, Mass. Sponsor: G R Griffin.

NOT AFFILIATED WITH A SECTION

Transfer to Junior

Marcel Menard—Dyer, asst supt, Penman's Limited, St Hyacinthe, Que, Canada. Sponsors: G J Mandikos, G M Kidder.

Elected to Membership

March 6, 1961

No designation after name indicates Senior
(A) indicates Associate
(J) indicates Junior
(S) indicates Student
* indicates transfer from another class of membership.

NEW ENGLAND REGION

Northern New England Section

Paul J Angelo Jr
Anthony D Fernandez
Theodore D Forman Jr
Harry D Sentkowski (A)

CENTRAL ATLANTIC REGION

Delaware Valley Section

Philo D Atwood
*Robert M Bateman**
*Ronald L Depoe**

Metropolitan Section

John F Gellene
Philip Rubin (A)

Niagara Frontier Section

Paul M Rooney (A)

SOUTHERN REGION

Northern Piedmont Section

Charles E Boger Jr
Alton D Rickman (J)
*William Conn**

Palmetto Section

Harold O Bryant Jr
Lexie D Walters (J)

Piedmont Section

Charles V Tallman
George C Holland (J)

Southeastern Section

Richard L Arceneaux
Austin L Bullock
Carroll L Hoffpauir

WESTERN REGION

Pacific Northwest Section

Joseph B Durra (A)

STUDENT CHAPTER

North Carolina State College

Bahaa E D Raafat (S)

NOT AFFILIATED WITH A SECTION

Lucien H Marcou
Karl Neufang
Carlos M Marquez (A)

Activities of the Local Sections

New England Regional Meeting

PLANS for the New England Regional Meeting, to be held on Friday and Saturday, May 5 and 6, are well under way. This meeting, cosponsored by the Northern New England, Rhode Island, and Western New England Sections, will be held at the Jug End Barn, South Egremont, Mass.

The Jug End Barn is an ideal spot for a convention located in the beautiful Berkshire Mountains and having fine recreational facilities including a nine-hole golf course, a heated swimming pool, and horseback riding.

The schedule for the two days follows:

Friday, May 5th

9:00 am—Registration

12:00 noon—Lunch

2:00 pm—Technical session on cellulosic fibers

8:00 pm—Dinner and nontechnical speaker

Saturday, May 6th

8:30 am—Breakfast

10:00 am—Technical session on wool and wool blends

12:00 noon—Lunch

1:30 pm—Recreation.

The six-man committee in charge of this meeting consists of:

Chairman — Robert D Robinson (NNE)

Vice chairman—Robert H Phillips (RI)

Technical Program—John J Roarke (RI)

Registration & Reception—Albert H Rant (WNE)

Entertainment & Dining—Edward McNamara Jr (NNE)

Publicity — Timothy J Horan (WNE)

In addition, the following will serve as sectional representatives on the Reservations and Reception Committee, which will be available in the registration area beginning Friday morning: William Pennock and John Markgren (NNE); Raymond Taylorson and Richard Mullin (Rhode Island); and Frank Baker and Arthur Bibeau (WNE).

All members and friends are cordially invited to attend this Regional Meeting. Those wishing reservations should make them at the earliest opportunity by contacting the Jug End Barn at South Egremont, Mass.

L to r: George P Paine, executive secretary, AATCC; R J Tyrrell, Peerless Textiles, chairman, South Central Section; Elliott Morrill, Corn Products Co, AATCC president.

South Central

SOUTH CENTRAL SECTION held its Winter Meeting at the Wimberly Inn, Chattanooga, Tenn, on Saturday, February 18, with Sectional Committeemen William Martin Jr, Koppers Co, in charge.

In place of the regular afternoon technical session, George P Paine, executive secretary of AATCC, presented a talk entitled "AATCC Sections and the National Association", the text of which appears in this issue of the *Proceedings*. (See page 44).

Following a social hour in the Edgewood Room at 6 pm with Geigy Dyestuff's Robert Maurer in charge, the evening banquet was held in the Cotillion Room, at which AATCC's president, Elliott Morrill, Corn Products Co, spoke on the subject "The Textile Consumer Looks at AATCC". (This article appears on page 32). Mrs Morrill also attended the social hour and banquet. R J Tyrrell, Peerless Textiles, South Central Section chairman, presided at the banquet.

Approximately 85 persons attended the afternoon session, and 125 were present at the banquet.

•

Northern New England

SAMUEL J GOLUB, associate director, ACH Fiber Service, Inc, Boston, Mass, will speak on "The Impact of the New Labelling Act on the Textile Industry" at the March 24 meeting of the Northen New England Section. The meeting is to be held at the Colonial Country Club, Lynnfield, Mass, with a cocktail hour starting at 6:00 pm, followed by dinner at 7:00 pm.

Rhode Island

THE March 24th meeting of the Rhode Island Section will be held at Lindy's Bali Room in Cranston, RI.

For the first time, the Section is conducting a Member-Guest Meeting to better acquaint nonmembers with the activities of the Section. If this meeting is as well attended as expected, the Sectional Officers will recommend that all Sections Institute a similar annual program.

Final and complete information will be given about the New England Regional Meeting to be held May 5 & 6 at the Jug End Barn in South Egremont, Mass. Sections participating will be Northern New England, Western New England and Rhode Island.

The speaker at the Member-Guest Meeting will be Raymond J Schuster, Technical Sales Service Division of The Chemstrand Corp. His subject will cover, "Dyeing and Finishing of Acrilan and Acrilan Blends".

•

Southeastern

THE date of the next regular quarterly meeting of the Southeastern Section, originally scheduled for April 8 at the Atlanta Athletic Club, has been changed to April 22.

•

Delaware Valley

DELAWARE VALLEY SECTION will hold its annual Ladies Nite meeting Friday, April 14 in the Colony Room of the Cherry Hill Inn, Haddonfield, NJ

Four top-notch vaudeville acts plus dancing until 1 am have been slated.

Future Papers

THESE papers have been submitted for publication in future issues of the *Proceedings:*

"Science and Craft in Color"—Panel

"Modern Continuous Dyeing Processes"—Richard Kern, Sandoz Ltd

"A Study in Union Dyeing"—Northern New England Section

"Selection of Direct Dyestuffs for Application to Undesulfured Rayon Staple"—Southeastern Section

"Dyeing with Vinyl-Sulfone Reactive Dyes"—H Luttringhaus, Carbic-Hoechst Corp

"Status of Nonwoven Fabrics in the Textile Trade"—Howard W Shearer, American Viscose Corp

"New Fibers from DuPont"—Milton M Christie, E I du Pont de Nemours & Co, Inc

"Recent Developments in the Dyeing of Verel Modacrylic Fiber"—R J Fortune, Tennessee Eastman Co

"New Color-Measuring Instruments for Use by the Textile Industry"—F J Rizzo and A O Ramsley, Quartermaster Research and Engineering Command, U S Army

"The Application Principles of Acrylic Backcoating"—Charles E Hoey, Rohm and Haas Co

"Dyeing Zefran Acrylic Fiber in Blends"—F M Rawicz and S Helfand, Dow Chemical Co

"American Standard Performance Requirements for Textile Fabrics"—Ephraim Freedman, Macy's Bureau of Standards

"The Effect of Weft Yarn Twist upon the Properties of Cotton Fabrics Before and After Resin Treatment"—Edna Meshke, Univ of California

Employment Register

This column is open for two insertions per year, per member, without charge. Blanks may be obtained from, and filed with, the secretary of the Association, Post Office Box 28, Lowell, Mass. It is understood that these will be open to inspection by prospective employers who can obtain further information from the secretary.

61-4

Education: High school, Bielle, Italy; graduate—wool dyeing and chemistry, Textile University, Roubaix Nord, France; St Gal, Switzerland; and Univ of Leeds, England.
Position desired: Dye master in mill treating wool, cotton and synthetic fibers.
Location: Anywhere.
Age: 54; single; complete reference on request together with resume.
3-20, 4-3

61-5

Education: K B Tech Institute, India; City & Guilds of London Institute; specialized training at ICI (England), M/S—Bayer, BASF (Germany); Ciba, Geigy (Switzerland)—1958
Position desired: Wet processing (dyeing, bleaching, printing and finishing); departmental executive—technical personnel.
Location: center of textile wet processing.
Age: 49, married, references on request.
3-20, 4-3

61-6

Education: BS, Rhode Island School of Design.
Position desired: Textile research, development, testing or plant operations.
Location: Northeast acceptable—no restrictions.
Age: 21, single, references.
3-20, 4-3

AATCC Deceased

Member	*Section*
JOHN W HUBER Onyx Chemical Corp Philadelphia, Pa	DV
KARL HAHN National Aniline Div Allied Chemical Corp New York, NY	Met
ALFRED F MAULDIN Acme Hosiery Dye Works Pulaski, Va	NP
ROBERT GOW JR Great Barrington Mfg Co Great Barrington, Mass	NNE

CORRECTION

THE 1960 *Technical Manual,* Vol 36, contains an error on page 88 in Test #85-1960, Colorfastness to Drycleaning, which seriously affects the performance of the test.

The amount of perchlorethylene required for the proper conduct of the test is 200 ml, not 100 ml as shown. The correct amount was given in the original publication of this test in the April 12, 1960 issue of *American Dyestuff Reporter.*

Also, in Paragraph 2 under Notes, reference to Tentative Test Method #85-1957 should be corrected to show reference to the new drycleaning test adapted in 1960 which has replaced it.

NOMINATIONS FOR THE HAROLD C CHAPIN AWARD

THIS award is presented annually at the Association's Annual Convention to a Senior Member of at least twenty years continuous membership in AATCC who has contributed outstanding service in enabling the Association to attain the objects for which it was founded. The award is in the form of a suitably worded, framed, illustrated scroll.

Established in 1958, the first recipient was Harold C Chapin, for whom the service award was named, who served as secretary of AATCC during a quarter of century. Dr Chapin was cited for his example that inspired the creation of the award, for his outstanding leadership, for dignity and integrity in office, for indefatigable attention to minor detail and major policy, for advancing the Association's objectives, for bringing national and international prestige to the Association, and for long and devoted service.

The selection of the recipient is by the unanimous choice of a committee consisting of one member from each of the four Regions, appointed for four years by the Councilors of the respective Regions, the president of the Association ex-officio, and the executive secretary as secretary of the committee without vote. The committee rotates annually with the occurrence of one vacancy to be filled, the chairmanship being assumed by the committee member serving his fourth year. No committee member may be reelected for at least one year following completion of his term.

Senior Members of AATCC are invited to furnish full and detailed information of candidates nominated for this award, such as service on AATCC Research and Council Committees, accomplishments and contributions in enabling the Association to attain the objects for which it was founded. Organized campaigns promoting the candidacy of any individual will not be recognized by the committee. Consideration will be given only on factual evidence of the nominee's qualifications.

Nominations may be addressed to the Harold C Chapin Award Committee, c/o the executive secretary, AATCC National Headquarters, Box 28, Lowell, Massachusetts, and should be received prior to April first.

PERMACHEM

(The long-lasting, durable bactericide*)

*Surface areas in hospitals are treated with Permachem to reduce the bacterial colony count.

In fabrics (clothing, socks, bedding, upholstery, etc.) it aids in reduction of bacteria which cause odors and diseases, by making goods sterile; contact destroys harmful germs.

Kills virtually all bacteria---
Long-lasting---
Resists washing---
Economically feasible---
Safe; no toxic effects---
Easily handled by operatives---

Permachem may be applied in normal textile processing and is easily handled by your operatives.

For information on application in your mill, please contact our office (TRinity 6-1797); our technical representative will visit with you if you so desire.

Warp Sizing: *Softeners, Binders, Penetrants, Ty-In Penetrants, Shuttle Dressing, Waxes.*

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Niagara Twist-Setter: *Yarn Conditioning Penetrants.*

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Here, to meet your needs for resin and rubber latices, is Marbon Chemical's new multi-million dollar research and production facility on the Ohio River. In every way—plant facilities, equipment and personnel—you'll find Marbon the truly modern source for your requirements. Let us prove it—write today, Dept. B-3.

MARBON CHEMICAL DIVISION **BORG-WARNER**
WASHINGTON WEST VIRGINIA

Abstracts

(*continued from page 23*)

Developments in Dyeing Acrylics

Kramrisch, B, *Dyer 124*, 1019, Dec 30, 1960

Four groups of acrylic fibers are discussed by the author:

1) Polymers containing at least 85% acrylonitrile—Orlon, Courtelle and Acrilan 16 (or C3).

2) Basified copolymers—Acrilan and Creslan.

3) Polymers of acrylonitrile with vinyl or vinylidene compounds—Dynel and Verel.

4) Nitrile "alloy"—Zefran.

The application and properties of disperse, modified basic, and acid dyes are discussed, with particular reference to fastness to light, washing, pleating and Hoffman pressing, and also to difficulties experienced on drying, particularly as regards alteration in depth of shade with anionic dyes on Acrilan.

Acrylic fibers may be dyed with metal-complex dyes at temperatures above 100°C in the presence of salts (eg, NaCl or Na_2SO_4). This process is covered by BP 777,354.

The 1:2 metal complexes (Cibalans) have a high standard of fastness to light and wet treatments on acrylic fibers, comparable in fastness to similar shades dyed on wool with chrome dyes.

Unions of wool with Orlon or Courtelle may be dyed in a bath containing combinations of modified basic (Deorlene) and milling acid dyes and acetic acid. An addition of Emulsifier OC is recommended as an antiprecipitant, and of Univadine W to permit the use of milling dyes under acid conditions. Both solid and two-color effects can be produced in this manner.

Unions of Acrilan and nylon may be dyed with Deorlene dyes and cross-dyed with acid milling, alizarine or Cibalan dyes. Here also, solid and two-color effects are obtainable.

Zefran may be dyed with direct, sulfur, vat and azoic dyes, with fastness properties comparable to results produced with the same dyes on cotton.

The author suggests, as some of the principal textile outlets for the acrylic fibers, knitted outerwear, also suitings, dress materials and pleated skirts in unions with wool and spun rayon. He states that interest has also been shown in their use for blankets, carpet yarns and scatter rugs.

•

Advances in the Vigoureux Printing of Wool

Anon, *Dyes Chem Tech Bull (Du Pont) 16*, 136-9, Dec, 1960

Items in recent trade journals indicate that the fixation of dye in Vigoureux prints on wool can be accelerated by the incorporation of a solvent such as benzyl alcohol in the printing paste. Because of this current interest, the observations on this subject of the Du Pont Technical Laboratory have been published.

The popularity of Vigoureux printing in the U S has been adversely affected by the relatively long steaming time required to fix the dyes. In conventional American practice, a batch procedure is employed; the actual printing of the slubbing (usually with chrome dyes) is accomplished at economical speeds, but each run is batched, and packed into a large chest into which steam at atmospheric pressure is admitted for periods of four or more hours.

The experimental work of the authors, however, indicates that the time of steaming at atmospheric pressure can be substantially reduced to one-half hour or less, and that continuous steaming to fix and develop the dye on the wool appears feasible.

Two continuous steaming approaches are suggested. In one, the printed slubbing would be plaited onto an apron and transported through the steam chamber; in the other, the printed slubbing would be piled in a "J" tube, the bottom or short side of which would be a moving belt. In either case, copious quantities of steam at 212-215°F would be supplied.

The printing formula for chrome dyes recommended by the authors contains thiodiglycol (Union Carbide's "Kromfax Solvent"), oxalic and acetic acids, sodium chlorate and chromic fluoride. Thiodiglycol acts as a potent solvent for the dye, and the color value is improved by its use. Oxalic acid inhibits premature chroming of the dye. Sodium chlorate prevents reduction of azo groups in the dye molecule. From five to 15 minutes of steaming produces optimum fixation of the dyes, the authors say.

In addition to a full range of chrome dyes, certain neutral-dyeing premetallized dyes may also be employed (for light shades) by means of a short steaming. Here also thiodiglycol assists fixation of the dye.

The above observations suggest that a decided reduction in the time required for Vigoureux prints can be accomplished.

•

The Development of "Wash-and-wear" Wool Fabrics for Modern Home Laundering

Brown, A E and Krasny, J F, *J Textile Inst 51*, T1414-34, Dec, 1960

"Wash-and-wear" performance is defined as the ability of garments (eg, of cotton) to emerge from machine laundering and tumble-drying, as practised in American homes, without change in dimensions and surface fuzziness, and with only very minor mussiness or wrinkling. Earlier work indicated that wool fabrics with such performance are also possible. The present paper analyzes the effect of yarn and fabric construction variables on the "wash-and-wear" performance of worsted fabrics; extension of the study to woolen fabrics and to the effect of finishing methods is planned.

Of the 123 fabrics studied, 34 did not shrink at all, and an additional 43 shrank between 0 and 2% in area after 10 machine-washing and drying cycles. Use of finer rather than coarser yarns and compact constructions were most important for shrinkage control.

Most of the fabrics were muss-resistant, and they were superior in this respect to many textiles presently considered as "wash-and-wear". Mussiness increased with decreasing fabric weight.

Fuzz formation in laundering was considered excessive from a consumer's point of view in only a few of the fabrics. It was reduced by using compact constructions and fine yarns.

To obtain best results in controlling the three "wash-and-wear" characteristics mentioned (shrinkage, mussiness and fuzziness), a heavy-weight fabric, made from densely spaced, coarse yarns in plain-weave or 2/1 twill, is recommended. For lighter fabrics, finer yarns can be used, with the textures reduced; this will result in equally good shrinkage and fuzz control, but slightly increased mussiness Similar warp and filling yarn diameters are desirable. Choice of fiber variables, single or two-ply yarns, and amount of twist and twist direction are minor factors.

Analysis of all the results indicates that many untreated wool fabrics can be used in "wash-and-wear" garments. Further broadening of the fabric range can undoubtedly be accomplished by proper application of chemical stabilization treatments, as well as by proper fabric construction based on the above principles. Effective setting treatments will be necessary to obtain permanent creases or pleats.

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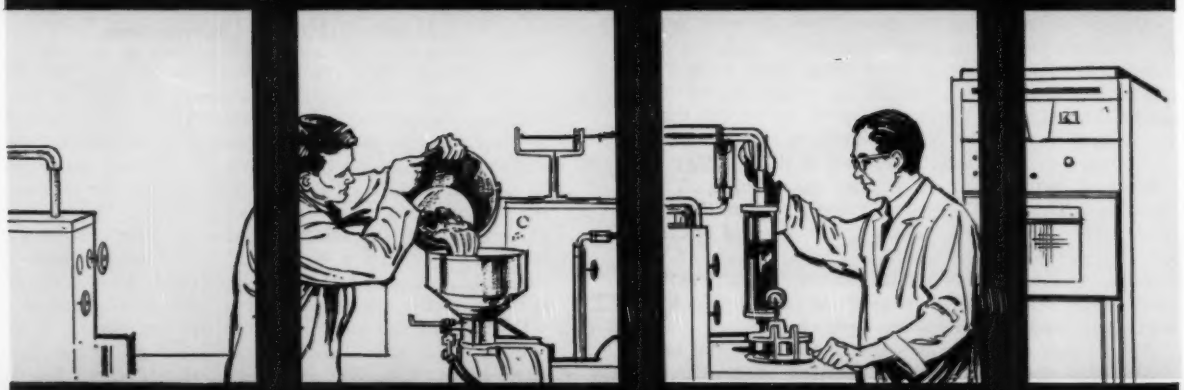

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Investigations on the Mechanism of Dyeing Polyamide Fibers

Zollinger, H, *Dyer 124, 731-2, Nov 4, 1960*

Recently it has been shown that neutral-dyeing 2:1 metal-complex dyes of the Irgalan type are taken up by polyamide fibers by two simultaneous mechanisms, namely by a salt formation of the dye with amino end-groups, and by a so-called solution mechanism.

By a systematic variation of the constitution of monobasic acid dyes it is now shown that a similar dual process takes place also in acid dyeings, and that the relative importance of the two mechanisms is closely related to the tendency of the dye molecules to form aggregates.

The relative importance of the solution mechanism is dependent on the constitution of the polyamide. In the series nylon 66, 68, and 610 it decreases, whereas in the series of the poly-ω-amino-carboxylic acids there is a decrease from nylon 6 to 8, but nylon 11 has a higher affinity than nylon 8. This fact is of practical value for the dyeing of Rilsan, the nylon 11 fiber.

The mode of fixation of dye molecules on the fiber by the solution mechanism has been studied intensively. With 2:1 metal-complex dyes and acid dyes with high tendency to aggregation (eg, Roccelline), the solution mechanism seems to be a simultaneous and independent process with respect to the salt-formation mechanism. However, it cannot at present be decided if this solution mechanism is a molecular-disperse solution of acid dye molecules (similar to the disperse dyeing process) or a physical adsorption in mono- or multimolecular layers. As a tentative hypothesis the author proposes that the additional (solution mechanism) process consists of the adsorption of dye particles on dye particles adsorbed by salt formation.

The dye uptake of nylon 66 can be very substantially controlled by thermal fixation processes in the case of acid dyes and metal-complexes; dry heat (140-180°C) decreases the number of amino end-groups. Thermal treatments, on the other hand, influence the uptake of disperse dyes to a relatively small degree only. It is concluded that the barré effect on polyamide fabrics might be due to uneven thermal conditions in the manufacture of the filament.

The problem of the constitution of polyamide end-groups under dyeing conditions is also discussed.

Four references to the literature are cited.

GENERAL CALENDAR OF COMING EVENTS

ACHEMA
June 9-17 (13th International Chemical Engineering Exposition and Congress———Frankfurt am Main, Germany)

AMERICAN CHEMICAL SOCIETY
Mar 21-30 (139th National Meeting, St Louis, Mo)

AMERICAN COTTON MANUFACTURERS INSTITUTE
Mar 23-25 (12th Annual Meeting, Fontainebleau Hotel, Miami Beach, Fla)

AMERICAN HOME ECONOMICS ASSOCIATION
June 27-30 (52nd Annual Meeting———Cleveland, Ohio)

AMERICAN OIL CHEMISTS' SOCIETY
May 1-3 (34th Annual Meeting, Sheraton-Jefferson Hotel, St Louis, Mo)

CHICAGO SECTION, AMERICAN CHEMICAL SOCIETY
Sept 5-8 (11th National Chemical Exposition———Chicago Amphitheatre, Chicago, Ill)

FIBER SOCIETY
April 27-28 (Spring Meeting———Georgia Center for Continuing Education, Athens, Ga)

INTER-SOCIETY COLOR COUNCIL
April 10-12 (30th Annual Meeting———Sheraton Hotel, Rochester, NY)

INTERNATIONAL TEXTILE MACHINERY EXPOSITION
Sept 1962 (3rd Exposition, Hanover, Germany)

KNITTING ARTS EXHIBITION
April 24-28 (Atlantic City Auditorium, Atlantic City, NJ)

NATIONAL COTTON COUNCIL OF AMERICA
Nov 8-9 (1961 Chemical Finishing Conference———Sheraton Park Hotel, Washington, DC); Oct 3-4, 1962 (1962 Chemical Finishing Conference———Sheraton Park Hotel, Washington, DC)

PHI PSI FRATERNITY
May 4-6 (58th Annual Convention, Shoreham Hotel, Washington, DC)

PURDUE INDUSTRIAL WASTE CONFERENCE
May 2-4 (16th Conference———Purdue Memorial Center, Lafayette, Ind)

QUEBEC SECTION, CANADIAN ASSOCIATION OF TEXTILE COLOURISTS AND CHEMISTS
Apr 21-22 (Annual Meeting and Dinner, Sheraton-Mt Royal Hotel, Montreal, Que); June 10 (Annual Golf Tournament—Drummondville Country Club, Drummondville, Quebec)

SCHWEIZERISCHER VEREIN DER CHEMIKER-COLORISTEN
October 12-14 (Symposium on "Permanent Finishing 1961"——— Swiss Federal Institute of Technology, Zurich, Switzerland)

SYNTHETIC ORGANIC CHEMICAL MANUFACTURERS ASSOCIATION OF THE UNITED STATES
Apr 13 (Luncheon Meeting———Palm Terrace Suite, Hotel Roosevelt, New York, NY); May 22-24 (Spring Outing———Skytop Lodge, Skytop, Pa); June 15, Sept 12, Oct 10, Nov 14 (Luncheon Meetings———Palm Terrace Suite, Hotel Roosevelt, New York, NY); Dec 7 (Annual Meeting and Dinner———Hotel Roosevelt, New York, NY)

UNION OF PURE AND APPLIED CHEMISTRY
August 6-12 (18th International Congress of Pure and Applied Chemistry———Montreal, Canada)

WORLD CONGRESS FOR MAN-MADE FIBERS
May 15-18, 1962 (2nd World Congress, London, England)

FUTURE PAPERS

The following specially contributed articles have been accepted for publication in American Dyestuff Reporter during 1961:

"The Effect of the Unsaturated Group on the Weathering of Chemically Modified Cottons"———Ricardo H Wade, Carl Hamalainen, and Albert S Cooper Jr, Southern Regional Research Laboratory

"Energetic Interactions between Textile Fibers and Solid Soil in the Washing Process"———H Lange, Henkel & Cie, GMBH

"A Study of Hypochlorite-resistant Melamine-type Finishes"——— Sidney L Vail, J G Frick Jr and J David Reid, Southern Regional Research Laboratory

"Formamide-Formaldehyde Products as Wrinkle-Resistance Finishing Agents for Cotton Fabrics"———Sidney L Vail, J G Frick Jr, Paul L Murphy Jr and J David Reid, Southern Regional Research Laboratory

"Dyeing Unscoured Wool"———Louis I Fidell, American Cyanamid Co

"Dihydroxyethyleneureas as Wrinkle-resistance Finishing Agents for Cotton"———Sidney L Vail, Paul J Murphy Jr, J G Frick Jr and J David Reid, Southern Regional Research Laboratory

"Formic Acid Colloid of Methylolmelamine Resin Finish of Cotton for Wrinkle- and Muss-Resistance: Preliminary Cost Study"——— K M Decossas, O J McMillan Jr, W N Berard, W A Reeves, E F Pollard and E L Patton———Southern Regional Research Laboratory

"Wrinkle- and Muss-Resistant Finish for Cotton Using Formic Acid Colloid of Methylolmelamine"———W Norbert Berard, Ethel K Leonard and Wilson A Reeves, Southern Regional Research Laboratory

"New Methods for the Preparation of Alkali-soluble Textile Materials"———Robert M Reinhardt, Terrence W Fenner and J David Reid, Southern Regional Research Laboratory

"Continuous Dyeing of Orlon Acrylic Tow"———R J Thomas, E I duPont de Nemours & Co, Inc

"The Influence of a Surface Finish on the Flex Abrasion Resistance of Cotton Sateen"———Clarence J Pope and Louis I Weiner, U S Army Quartermaster R&E Command

"Preparation and Properties of Fibrous Partial Isobutyrates of Cellulose"———Hubert St Mard, Carl Hamalainen and Albert S Cooper Jr, Southern Regional Research Laboratory

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ADR News Report:

General News of the Industry
Personalities in the News
New Products, Developments, Processes

Bolton to Head ATMA

John H Bolton Jr, vice president, Whitin Machine Works, Whitinsville, Mass, was elected president of the American Textile Machinery Association, at the 28th annual meeting of ATMA held last month in Boston, Mass. He succeeds William K Child, vice president of Draper Corp, Hopedale, Mass, who has headed the Association for the past two years. Robert S Pennock, vice president, Leesona Corp, Providence, RI, was elected vice president of ATMA, and was also made a member of the board of directors. F Gorham Brigham Jr, who has served as treasurer of ATMA for the last four years, was re-elected to that post for the fifth consecutive term. Mr Brigham is financial vice president of Epsco, Inc, Cambridge, Mass.

Directors-at-large for 1961 elected at the meeting are: Mr Bolton, Mr Pennock, Mr Child, and J E Butterworth, president, H W Butterworth & Sons Co, Bethayres, Pa; Roy G Ross, vice president, Barber-Colman, Rockford, Ill; and W Frank Lowell, president, Saco-Lowell Shops, Boston, Mass.

Division directors elected were: Hugh Bolton, president, Whitin Machine Works, Division I; Thomas Stilwell, sales manager, Textile Division, The Warner & Swasey Co, Cleveland, O, Division II; Frederic W Howe Jr, president, Crompton & Knowles Corp, Worcester, Mass, Division III; James H Hunter, president, James Hunter Machine Co, North Adams, Mass, Division IV; Robert Leeson, president, Leesona Corp, Division V; Thomas H West, president, Draper Corp, Division VI; and P Kay Schwartz, president, Proctor & Schwartz, Inc, Philadelphia, Pa, Division VII.

The Nominating Committee of which Robert Leeson was chairman, also included James H Hunter and J E Butterworth.

Following the business session, the board of directors in its annual meeting reappointed Mildred Gwin Andrews as executive secretary of ATMA. Mrs Andrews maintains ATMA offices within environs of Washington, DC. The address is PO Box 596, Vienna, Va.

American Textile Machinery Association, which reportedly represents 95% of capital equipment manufacturers for the textile industry, includes the following divisions: Division I—Cotton Preparatory and Yarn Machinery; Division II—Woolen and Worsted Preparatory and Yarn Machinery; Division III—Weaving Machinery; Division IV—Dyeing, Bleaching, and Finishing Machinery; Division V—Rayon Machinery; Division VI—Knitting Machinery; Division VII—Other Machinery.

Seated, l to r: John H Bolton Jr, newly elected president of ATMA; Robert L Garner, president of the International Finance Corp, who was guest speaker at ATMA's annual meeting last month

Standing, l to r: William K Child, retiring president of ATMA; Robert S Pennock, newly elected vice president of ATMA; and Charles F Hughitt, director, General Industrial Equipment and Component Division, Business and Defense Service Administration, U S Dept of Commerce

Becco Making Deliveries From New Midwest Distribution Center

Regular deliveries of Becco hydrogen peroxide began this month from the new Midwest distribution center in Villa Park, Ill, which was recently completed by the Becco Chemical Division of Food Machinery and Chemical Corp.

The new center (about 10 miles west of the Chicago city limits), will provide a source of supply of Becco chemicals for Midwest textile finishing plants, pulp and paper mills, and Becco customers in the electronics, metal-finishing, plastics, and chemical processing industries in this area.

The new Villa Park center is located at 649 North Ardmore Avenue at Hill Street, on a six-acre site alongside the Illinois Central Railroad's westbound main line. A large one-story warehouse, 120 ft by 100 ft, provides storage and filling facilities for hydrogen peroxide with ample space for latex expansion. The peroxide will be received at the center by rail, in tank-car quantities, from Becco's two main production plants in Buffalo, NY, and Vancouver, Wash, and brought directly into the warehouse by means of a 500-ft railroad siding. Deliveries from the center reportedly will be made by railroad and by trucks in the quantities and containers most suitable to the requirements of the individual customer.

Becco's other active oxygen chemicals, such as sodium perborate, ammonium persulfate, and potassium persulfate, will also be stocked for shipment to points in the Midwest area.

A one-story office block, 75 ft by 30 ft, located at the north end of the warehouse, will include headquarters for Becco's Midwest district manager, Vernon E Moore.

David C Howell has been appointed distribution supervisor for the new center and will be in charge of its operations.

Becco maintains similar distribution centers in Lyndhurst, NJ, to serve the Middle Atlantic States; in Framingham, Mass, to serve New England; and in Charlotte, NC, to serve Southern textile and paper mills.

The large storage tanks in the center are fabricated of high-purity aluminum, to prevent contamination of the concentrated hydrogen peroxide, and were constructed to the specifications of Becco's plant engineering department.

●

Rhodia Inc Appoints Jarnagin Associates

Frank W Jarnagin Jr & Associates, Fort Oglethorpe, Ga, has been appointed sales agent for Alamasks, industrial odor control chemicals produced by Rhodia Inc, New York. The annoucement of the appointment by J P Leroux, Rhodia sales manager, stated that Mr Jarnagin's company will be servicing industries in Alabama, Western Georgia and Tennessee.

●

Antara Names Three New Distributors

Antara Chemicals, a Division of General Aniline & Film Corp, 435 Hudson St, New York, NY, has announced the appointment of three new distributors for two major chemical product lines. They are: Central Solvents and Chemicals Co, 2540 West Flournoy St, Chicago, Ill; Hoosier Solvents and Chemicals Co, 1650 Luett Ave, Indianapolis, Ind, with a branch office at Nelson Road East, Fort Wayne, Ind; and Wisconsin Solvents and Chemicals Co, 1719 S 83rd St, Milwaukee, Wis.

Under these arrangements, the three companies will handle certain Igepal surfactants and the Cheelox chelating and sequestering agents; Central in northwestern Indiana, northern Illinois and eastern Iowa; Hoosier throughout the state of Indiana; and Wisconsin in the state of Wisconsin and upper Michigan.

The companies named will distribute Igepal CO and CA, nonionic surface-active agents produced by Antara.

These products will be supplied by the three new distributors in drum-lot truck shipments. In addition, bulk quantities of Igepal CA-630 and CO-630 can be supplied in tank trucks, including those compartmented for mixed-bulk shipments.

BRRA, Shirley Institute to Merge

A merger of the British Rayon Research Association and the Shirley Institute (BCIRA) is expected to be completed by the end of this month, following which the new research association will begin its activities at the BCIRA premises at Didsbury.

The title of the combined cotton and rayon research association is not yet known.

•

DAC Producing Dicarboxylic Acid Chlorides in Texas

Semicommercial production of isophthaloyl and terephthaloyl chlorides is underway at the recently constructed Diamond Alkali Co installation at Greens Bayou, Texas. These dicarboxylic acid chlorides reportedly are produced in flaked form of high purity.

Diamond recommends both chemicals as intermediates in polymer preparations and in various organic syntheses for dyes, plasticizers, pharmaceuticals, etc, where high reactivity, favorable solubility characteristics in many organic solvents and low melting points would be most advantageous.

Technical data sheets fully describing both chemicals are available, upon request, from Diamond Alkali Co, 300 Commerce Bldg, Cleveland 14, O.

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Reeves Bros, Shell Chemical Enter Agreement to Develop Polypropylene for Fibers

Reeves Brothers, Inc and Shell Chemical Co have entered into an agreement to develop polypropylene for its application in the fiber field. Intensive research reportedly is already under way toward the development of special grades and modifications of polypropylene which are suited for the manufacture of high-grade fibers.

It was announced that full advantage will be taken of Reeves Brothers extensive textile experience and Shell's knowledge of hydrocarbon polymerization.

•

American Felt Announces Filter Products Division

William H Lehmberg, president of American Felt Company, Glenville, Conn, has announced the formation of the company's Filter Products Division.

The new Filter Products Division, headquartered in Glenville, will be headed by Karl Del Porte, manager, who will be responsible to R Power Fraser Jr, general sales manager, for sales development and marketing activities of the new division.

In addition to the Feutron filter cartridge, the Filter Products Division will assume responsibility for sales development and marketing of the entire range of the Company's dry and wet filter media line, including wool felts, Feutron synthetic fiber felts, Windsor nonwoven, and fiber-bonded materials.

American Felt Company introduced its new Feutron filter cartridge a year ago, and it is said to have made substantial impact in the filtration field because of the precise micron tolerances to which it can be manufactured and the controllability of its performance, in addition to increased capacity and life. The Feutron filter cartridge uses the "edgewise" principle of filtration, is made of specified controlled-denier synthetic fiber felt, and is said to result in more precise control throughout the micron range.

•

Philadelphia Textile Accepts 46 New Freshmen

The Philadelphia College of Textiles and Science (formerly Philadelphia Textile Institute) accepted 46 entering freshman in February and boosted its enrollment to 423, giving it the highest number of degree students in its history.

The highest total enrollment 541 occurred in 1949; however, only 300 of these were degree students. Of the new total, 406 are enrolled in degree programs.

339 American and 84 foreign students comprise the new total. The foreign students are from 24 countries.

The new freshman include 32 from the United States and 14 from abroad.

Divided by courses, there are 109 in engineering, 55 in chemistry, 196 in management and marketing, and 46 in design.

MIT to Offer Summer Course in Applied Surface Chemistry

To augment its regular curriculum and research program in applied surface chemistry, the Chemical Engineering Department at Massachusetts Institute of Technology is offering a two-week course in this field during the 1961 Summer Session. Entitled "Fundamentals and Applications of Selected Surface Phenomena," the course will delve into detergency, filtration and drying, rheology of suspensions, surface effects in fuel cell technology, and heterogeneous catalysis. To compliment these practical applications involving surface effects, discussions will be held on the more basic topics of flow through porous media, flocculation and deflocculation, absolute reaction rate theory, physical and chemical adsorption, and electronic structure of catalysts.

The course will be directed by H J Bixler, assistant professor of chemical engineering. Lectures will be presented by members of the MIT Chemical Engineering Department along with invited lecturers from industry and other academic communities. Inquiries about this course to be held from June 26 through July 7 should be directed to the Office of the Summer Session, MIT, Cambridge 39, Mass.

•

HTC Celebrating 35th Year

Hatch Textile Research, Inc, 25 East 26th St, New York, NY, is celebrating its thirty-fifth anniversary this year with the addition of new tests and new equipment to meet new technological advances.

Herbert H Hatch, president, and John W Sheppard, vice president, who supervise all tests and analyses, have extended an invitation to those in the textile trade to visit the laboratory.

Mr Hatch states that the laboratory serves all segments of the industry, not only in New York, but throughout the United States. He suggests that recent years have seen an increasing need for textile testing by independent merchants, government contractors, and mill owners, who wish impartial, unbiased tests to establish fabric or yarn quality, or to corroborate their own research findings.

•

New Research Data Firm Offers Unique Services

Technical Aid Service, Inc, Columbus, Ohio, is now offering a service which is said to be especially tailored for management and research and development staffs. The service entails the reduction of technical literature to digests of basic principles, which are integrated into an intelligent retrieval system. These short summaries of technical data reportedly can be scanned and understood in a few minutes by scientific personnel, which are kept appraised of new developments as well as prior accomplishments revealed in technical literature.

When provided with these concise data, it is claimed that clients of this service can assimilate 50 to 100 articles a week in less time than is required to review a single lengthy article.

TAS prepares the analyses in accordance with an agreement established between the two companies. These data are then distributed to designated personnel of the client company.

Further information is available from S M Wannemacher, vice president, Technical Aid Service, Inc, 1500 West Third Avenue, Kingsview Building, Columbus 12, Ohio.

•

Phi Psi '61 Convention

The 58th Annual Convention of Phi Psi, national textile fraternity, will be held at the Shoreham Hotel, Washington, DC, on Thursday, Friday, and Saturday, May 4, 5, and 6.

Grand Council President Benjamin S Bellemere of Bellemere and Co, Reading, Pa, has announced that the general chairman for the event is a A Henry Thurston.

•

KAE Issue Next

Descriptions of exhibits of chief interest to ADR readers plus additional background material on the 45th Knitting Arts Exhibition will be featured on the April 17th issue of *American Dyestuff Reporter*.

The 45th KAE will be held April 24-28 at the Atlantic City, NJ, Convention Hall.

PERSONALITIES IN THE NEWS

Stevenson

Russell

Nevins

Rogers

Chase

Houtz

Ciba Co, Inc, Fair Lawn, NJ, has announced a reorganization of sales and administrative responsibilities.

C J Weidmann, vice president and technical director, has assumed increased responsibilities in the direction and coordination of the three product divisions.

C O Stevenson, formerly sales manager of the company's southern district, has been named manager, dyes division.

P J Luck and *P L Penaud* continue as managers of the chemical specialties division and pigments division respectively.

Other promotions announced at the same time by *K R J Horner*, executive vice president, include *F P Russell*, *F E Nevins* and *E R Rogers*.

Russell, formerly manager of Ciba's Philadelphia district, has been named commercial manager.

Nevins, formerly sales supervisor of the Philadelphia district, has been named manager of the Philadelphia district.

Rogers, formerly working on special assignments, has been named supervisor of marketing services.

●

The appointment of *William H Kieffer* as director of marketing, Fibers Division, American Cyanamid Co, was announced February 28 by *Alden R Loosli*, general manager of the division.

Mr Kieffer, who assumed the post March 1, will coordinate sales and merchandising operations for Cyanamid's Creslan acrylic fiber.

Charles P Bertland, assistant general manager of the division, who has been serving as acting marketing director, will now be free to concentrate his activities in the division's overall operations.

Mr Kieffer, formerly vice president and general sales manager of Ciba Co, Inc, previously served with Cyanamid from 1936 until 1948 in the dyes department, Calco Chemical Division, and was the first manager of Calco's Canadian office. This former division is now Cyanamid's Organic Chemicals Division.

●

Onyx Chemical Corp, Jersey City, NJ, has announced that *Arnold Lada* has been appointed district manager of the New York metropolitan sales area and *John C Findlan* has joined the sales staff as sales development director.

Dr Lada, previously technical services director, will be responsible for all field sales activities for the corporation in the city of New York, Long Island, northern New Jersey and southern New York.

Mr Findlan will direct application and market development of Onyx's Maprofix series of alcohol sulfate detergent raw materials and BTC and Ammonyx series of cationic germicides and industrial processing intermediates in new industries. He will also be in charge of the program to extend their usefulness in known applications, as well as directing new product market development and activities with government agencies.

Mr Findlan's previous position as sales manager of Geigy's Industrial Chemical Division provides background for administration of these activities.

●

R Bruce Baptie has been appointed sales manager of the Carwin Company, North Haven, Conn. He will be responsible for the sale of all lines of the company's products, which include organic chemicals, specialty isocyanates and high-temperature-resistant polyurethane foam systems.

He has been a member of the Carwin organization since 1948, occupying various positions in engineering, production and sales.

Winn W Chase retired on March 1 after 17 years with Interchemical Corp. Coincident with his retirement, Interchemical's Color & Chemicals Division announced the appointment of *Bert Bresky* as export manager and the appointment of *Otto Agricola* as advertising manager. Both appointments became effective March 1.

Mr Bresky has been with Interchemical Corporation since 1954, and has been assistant export manager for the Color & Chemicals Division for the last year. In his new position, he will be in charge of all the overseas activities of the Division. He will be assisted by *Grigsby Peabody*, who joined Interchemical in 1956 prior to which he was with the Export Department of American Cyanamid Co.

Mr Agricola, with 20 years service with Interchemical, has for the last 10 years been assistant advertising manager of the Color & Chemicals Division.

Before joining Interchemical, Mr Chase had been employed for 13 years by McGraw-Hill Publishing Co, where he was executive editor of *Textile World*. An alumnus of Brown University, he was in the Chemical Warfare Service in France during World War I, following which he went with Mount Hope Finishing Co. Since 1947 Mr Chase has been in charge of the overseas activities and market research and advertising programs of Interchemical's Color & Chemicals Division. He is the author of numerous articles and co-author of several books on the technical and economic aspects of the textile, synthetic fibers, and textile chemical industries. He is a member of AATCC, the Chemical Market Research Association, and other scientific and technical societies. Mr Chase plans to do a limited amount of consulting work in the textile and textile chemical fields.

●

J William Houtz has been named sales representative for the East Central District of General Electric's Silicone Products Department, Waterford, NY. His office location is 1503 Brookpark Road, Cleveland, O.

He joined General Electric last year as a salesman in training with the Silicone Products Department.

●

Otto F Habel has been promoted to the position of general product line manager—dyestuffs at General Dyestuff Co, a division of General Aniline & Film Corp. The dyestuff product managers, the technical manager and the supervisor—administrative services of GDC's Marketing Department will operate under the direction of Mr Habel, who has been with GDC since 1929.

Succeeding Mr Habel as product line manager—vat & sulfur dyestuffs is *J O Atwood*. Mr Atwood, who joined GDC in 1949, has been located in the Company's Charlotte, NC, office since 1952 as a technical representative and as manager—Charlotte Applications Laboratory.

Warren M Dewing, after forty years with GAF and GDC, is retiring. His position will be taken over by *H M Hartnett*.

Mr Dewing joined the predecessors of GAF in October, 1920 as a dyestuff salesman, was later named branch manager of the Boston office of GDC and since April 1, 1957 has been branch manager of the company's New England operations, located in Providence. Mr Dewing will remain with the firm on a part-time consulting basis for the time being.

Mr Hartnett, the newly appointed New England branch manager, joined GDC in 1930. He has been active as a salesman in the New England area, and prior to becoming assistant manager of the New England branch in Providence in 1957, he was for several years assistant manager of the Boston branch.

Kenneth C Loughlin on March 2 announced his retirement as president of Celanese Corp of America.

His retirement follows 32 years of service with the Corporation. A native of Wilmington, NC, Mr Loughlin joined Celanese in 1929 following graduation from North Carolina State College with a Bachelor of Science degree in textile chemistry and dyeing. Initially, he did laboratory and sales work, followed by 19 years' service as southern district sales manager.

In 1951, Mr Loughlin was appointed vice president of the Corporation's southern fibers sales and in the following year he became vice president and general manager of the Celanese Fibers Division. Prior to his appointment a year ago as president, he had served for 3½ years as executive vice president. He also has served as a member of the Corporation's Executive Committee and as chairman of the Management Committee.

Mr Loughlin has been a director of Celanese since 1954 and he will continue in that capacity. He is a director also of the North Carolina State Textile Foundation.

Harold Blancke assumes the office of president of Celanese Corp of America and will continue as the Corporation's chief executive officer, a capacity in which he has served since 1956. Mr Blancke also holds the office of chairman.

●

Key organizational changes have been made to strengthen the marketing and customer service function of Newport Industries Division of Heyden Newport Chemical Corporation.

The Division will now have four product sales managers, each responsible for developing sales programs and strategy.

Responsible for the over-all supervision of the new product sales manager task force will be *Leonard F Pinto*, named manager of sales development. Mr Pinto was previously the Division's manager for rubber chemicals and had been a member of the Division's technical sales service staff since 1947.

All appointees will be located ultimately at Pensacola. *J Korose* has been appointed product sales manager, rubber chemicals; *A G Dreis*, product sales manager, paper chemicals; *C A Brier*, product sales manager, resin chemicals; and *F J Stief*, product sales manager, terpene chemicals.

Reporting to Mr Pinto, each manager will exercise a functional control in a divisional marketing effort by coordinating planning, policies, and activities relating to his particular product lines. Each manager will also maintain a staff relationship with field sales personnel.

Mulvaney

Mackiewicz

Nichols

Antara Chemicals Division, General Aniline & Film Corp, has announced the appointment of *John F Mulvaney* as manager of the Linden, NJ, plant, succeeding *Francis Charles*, who was recently named director of manufacturing of the Division. *Richard W Mackiewicz* has been named manager—production services.

Until his current appointment, Dr Mulvaney was manager—Plant Production Department. Mr Mackiewicz was formerly supervisor—wage and salary administration at Linden.

* * *

Following the recent creation of a new Technical Department at Antara Chemicals Division, the following two executive appointments were announced:

Clement H Nichols has been named manager—Technical Engineering Department, and *Robert C Wilson* has been appointed manager—Technical Research Department. Both will maintain their offices at the company's Linden plant.

Mr Nichols, previously manager—Process Engineering Department, will be responsible for process development engineering and pilot plant studies relating to the Division's present product lines. Dr Wilson, until now assistant manager—process research development, will be responsible for research and development for the Division's present product lines.

●

Jack H King, formerly head finisher at the Wake Plant of Burlington Industries, has joined Cindet Chemicals, Inc, to take charge of its sales in the textile field. He is making his headquarters at the Company's main office in Greensboro, NC.

H A SUNDEEN

FUNERAL services were held January 16 for Harry A Sundeen, 63, who passed away January 10.

Mr Sundeen had been head dyer of Munsingwear, Inc., nationwide apparel manufacturing firm, until illness forced his retirement from active business last May.

Mr Sundeen joined the firm in 1921, became chief dyer in 1938, and was in charge of Munsingwear's extensive dyehouse operation for 22 years. During those years, through his pioneering efforts, many new techniques and methods were introduced. The firm's dyehouse, under his direction, grew to include complete experimental facilities and is now the largest textile and yarn dyeing operation in the midwest.

Mr Sundeen was a member of the Mid-West Section, American Association of Textile Colorists and Chemists and of Munsingwear's Loyalty Club.

Survivors include his wife and three brothers.

●

J L SCHROEDER

JOSEPH L SCHROEDER, 74, retired executive of American Cyanamid Co; head of the J L Schroeder Co, New York, NY; and a partner in the Wilmot and Cassidy Co, Brooklyn, NY, chemical manufacturers, died recently while vacationing in Rome, Italy. He lived in Westhampton, NY.

Mr Schroeder was one of the original stockholders and a director for many years of the Howes Publishing Co, Inc, publishers of *American Dyestuff Reporter*. He resigned as head of American Cyanamid Co's new business department and from the latter firm's board of directors in 1958. He then formed the firm which bears his name, which is in the bauxite business. He was also director of the Pittston Co, coal suppliers.

Survivors include his widow, two sons, and three daughters.

A BORN

ADOLPH BORN, 70, died recently of a heart attack at his home at Glen Rock, NJ.

Mr Born was for 25 years manager of the dyeing and finishing department of Forstmann Woolen Co, Passaic, NJ. He served as a finishing consultant for one year until his retirement in 1957.

Survivors include his widow, a son, and three brothers and a sister.

●

O BEZANSON

OSBORNE BEZANSON, former president and chairman of the board of The Chemstrand Corporation, died February 27, at Massachusetts General Hospital, Boston, after an extended illness. Burial was at Tatum, Texas, where he had made his home in recent years.

Mr Bezanson was president of Chemstrand from March, 1951, until December, 1953, when he was elevated to chairman of the board. He held the latter position until March, 1955.

He served with Monsanto Chemical Company for 45 years before becoming president of Chemstrand. He was a vice president and a director of Monsanto and a member of that company's Executive Committee, before assuming the Chemstrand presidency.

A native of Woburn, Mass, Mr Bezanson began his career in 1906 as a laboratory assistant with the Merrimack Chemical Co, which later became a Monsanto Division. In 1942, he was named general manager of Monsanto's Texas Division, and a year later was made general manager of the company's Organic Chemical Division at St Louis. He was made a vice president and director in 1942 and in 1948 was elevated to Monsanto's Executive Committee.

Survivors include the widow, three sons and two daughters.

NEW PRODUCTS AND DEVELOPMENTS

Eastman Introduces Five New Dyes

Eastman Chemical Products, Inc, subsidiary of Eastman Kodak Company, recently introduced five new dyes for synthetic textiles. Four have been developed for use on polyester fibers and one for acrylic fibers. The following characteristics are claimed for the new dyes by ECPI:

Eastman Polyester Brilliant Red FFBL—A blue shade of red, this dye is the brightest red in Eastman's line of dyes for polyester fibers. Exhibits excellent lightfastness and very good fastness to washing and perspiration. Used in dyeing wool and polyester blends, it stains the wool only slightly even in heavy shades.

Eastman Polyester Dark Brown GL—Developed particularly for men's wear, this dye produces neutral tans to full dark brown shades exhibiting excellent fastness to light, washing, crocking and perspiration. Dark shades can be produced economically due to the dye's very favorable build-up characteristics.

Eastman Polyester Brown 3RL—A strong orange shade of brown, this dye stains wool to a lesser degree than do most orange dyes. Its use as a replacement for oranges, reds, or yellows in achieving deep brown tones on wool and polyester blends is therefore suggested. In lighter shades it also contributes excellent lightfastness.

Eastman Polyester Navy Blue RL—This new dye provides exceptionally good color value in obtaining full bright shades of navy blue. Its build-up characteristics are excellent as is its fastness to light, washing, crocking and perspiration.

Eastacryl Blue 5GL—A cationic dye for acrylic fibers, this new Eastman dye provides the means of achieving brilliant green shades of blue which do not flare red under artificial light. It exhibits excellent wetfastness and lightfastness. It builds up well in heavy shades and is compatible with other basic dyes.

●

Rhoplex B-27

Low crocking, improved washfastness, freedom from discoloration, and superior resistance to cyclic aging are outstanding features of an acrylic polymer developed for use in pigment printing and other textile operations according to a recent announcement by Rohm & Haas Co, Philadelphia. The product, formerly known as Experimental Dispersion HA-773, has now been given the commercial name Rhoplex B-27 and is supplied as a nonionic milky emulsion of 45% active ingredient. Excellent mechanical stability of the emulsion offers great versatility in compounding, formulating and processing of various print systems, it is claimed.

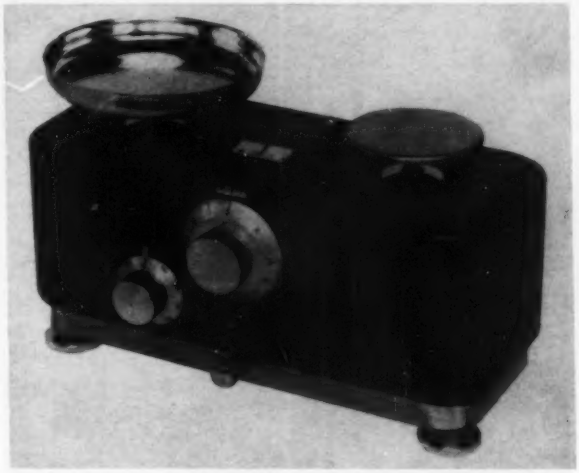
Rhoplex B-27 reportedly may be effectively utilized in both roller printing and screen printing, with either oil/water or water/oil systems. The product is also proposed by Rohm & Haas Co for bonding of nonwoven fabrics to obtain excellent fastness properties with stability to heat and ultraviolet exposure.

In oil/water printing formulations, Rhoplex B-27 is said to substantially increase the cyclic aging resistance of the color without introducing discoloration during processing or aging. Aging stability is of special significance when fabrics are used in such applications as draperies, where service conditions involve prolonged exposure to the sun followed by laundering. Fabrics treated with the new resin are said to exhibit remarkable resistance to crocking and color degradation when subjected to repeated cycles of this sun-exposure and laundering.

As a bonding agent for nonwoven fabrics, Rhoplex B-27 is said to offer excellent fastness properties, softness of hand and stability with regard to hand and color. Crosslinking with thermosetting resins is said to substantially enhance the product's resistance to commercial laundering and drycleaning as well as offering additional crease resistance. Rhoplex B-27 may also be used as a hand modifier for resin-treated fabrics.

Rhoplex B-27 is listed at 25¢ per pound in truckload drums; and 25½¢ per pound in less than truckload drums, fob Bristol, Pa.

A technical bulletin, #T-58, describing the properties and uses of Rhoplex B-27 is available. Requests should be directed to Textile Chemicals Department, Rohm & Haas Co, Washington Square, Philadelphia 5, Pa.



DWL-5 Torsion Balance

DWL-5 Torsion Balance

By dialing-in new weight loaders and fine weighing in two motions, laboratory weight readings can be made in less than one third the usual time with a new 500-gram capacity torsion balance, it is claimed. The new two-dial, oil-damped balance, designated as DWL-5, is manufactured by The Torsion Balance Company, Clifton, NJ.

Up to 90 grams of weight loading can be dialed in by 10-gram increments with one hand. The fine-weighing dial then adds up to 10 grams more by one-tenth gram graduations. Both dials can be used without arresting the balance. The DWL-5 has a reported accuracy of 50 milligrams.

Fast damping of balance oscillations with an oil dash pot reportedly permits quick and accurate weight readings. Dial weight loading eliminates all weights below 100 grams. The fine weighing dial has a readability of 20 milligrams. This sensitive dial mechanism has endured one-million weighings in laboratory tests without losing its accuracy, it is claimed.

The removable weighing pan is made of corrosion-resistant stainless steel and has a diameter of 5". Metal case, 11¾" × 6" × 6¾", has a smooth gray chemical-resistant finish. Net weight is nine pounds.

●

Cuprofix Blue C-FBL; Cuprofix Black C-FBL Pat

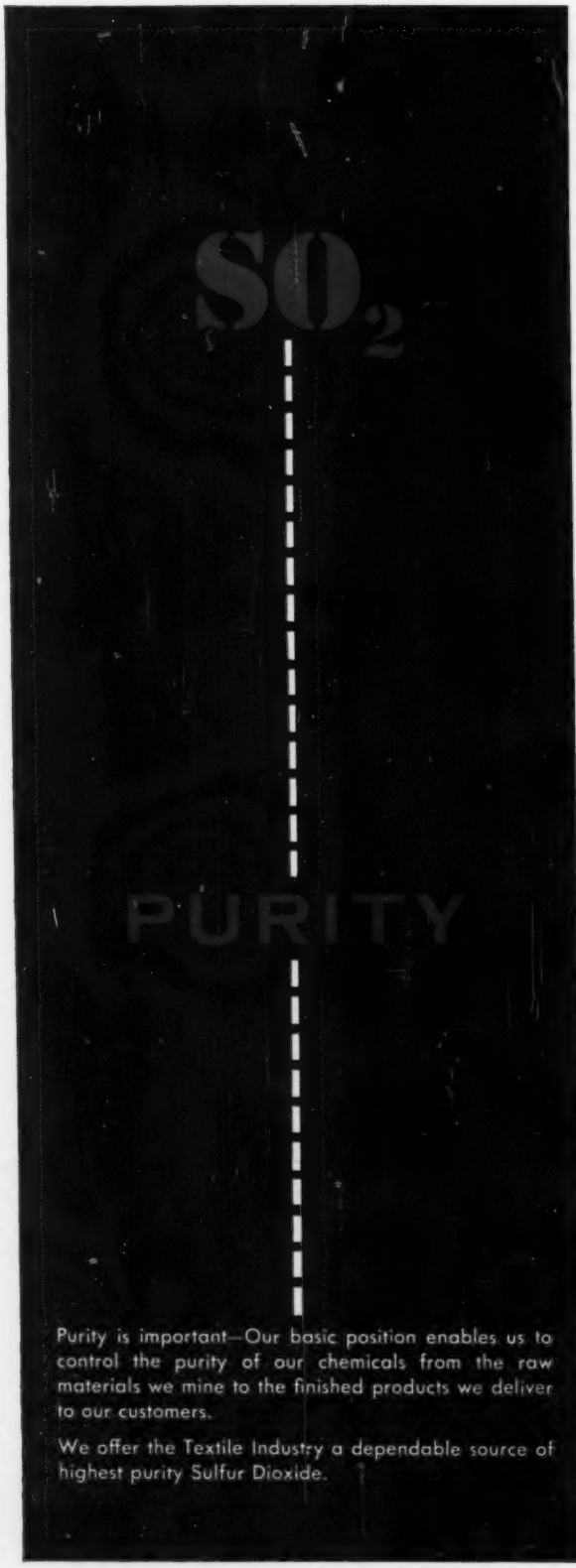
Release of two new aftercoppering direct dyes, Cuprofix Blue C-FBL and Cuprofix Black C-FBL Pat, has been announced by Sandoz, Inc, New York 13, NY.

Stated to exceed all other Cuprofix blues in brightness and clarity of shade, Blue C-FBL is being recommended by Sandoz for all types of cotton or viscose materials where exceptional fastness to light and washing are desired. Its fastness to hot pressing is said to be good, and it is white dischargeable if discharged prior to coppering.

Special applications for Cuprofix Blue C-FBL include royal blues on knitgoods and other washable materials of cotton and viscose; and to brighten up fast blues and navy shades for resin-treated fabrics.

Cuprofix Black C-FBL Pat is a homogeneous dyestuff for dyeing fashionable bluish blacks on cellulosic fibers. Apparel applications for this black include dress goods, linings, rainwear, knit goods, yarn, and sewing threads. It is also useful for coloring jute, hemp, and sisal in all forms.

Cuprofix Black C-FBL Pat reportedly has very good lightfastness and is stable to resin finishing. It is said to be highly soluble and therefore well suited for padding processes including the Pad-Roll System and for high-temperature dyeing. It is said to cover dead cotton and to dye level on barré viscose. It gives a good reserve of small acetate effects.



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☐ Olapon—a series of synthetic compounds for scouring and dyeing all natural and synthetic fibers.
☐ Hydrasol—cresylic acid scouring and kier assistants. Especially good for use on wool and cotton.
☐ Mercerizing Penetrants—a series of cresylic acid type penetrants for use with all strengths of caustic soda up to 80° TW. Non-cresylic types are also available.
☐ Laurel Transfer Removers—a line of products for all types of transfers to be applied by either wet or drying processing.
☐ Boil-Off Compounds—Boil-off oils, Triconate boil-off powders, Supersulfate neutral boil-off powders.
☐ Amine Condensates—straight and compounded to suit your requirements.
☐ Alkyl Aryl Sulfonates—Liquid, paste, and powder. Neutral or built for all purposes. Amine or sodium salts available.
☐ Sulfated Esters—for wetting, dyeing, rewetting. Preshrinking assistant.
☐ Lauramine 20—superior packaged dyed yarn lubricant and softener. Does not yellow whites or alter shades.
☐ Lauramine 20A—A liquid form of Lauramine 20. Predispersed for simplified use.
☐ Catamine SF—excellent cationic softener for natural and synthetic fibers. Especially dispersed. Particularly effective on Orlon and wool knitted fabrics.
☐ Sulfonated Oils—tallow, castor, olive, neatsfoot. Available straight or compounded for special finishing problems.
☐ Flame Retardants—a series of renewable type products to cover all requirements on cotton fabrics.
☐ Water Repellents—renewable type.
☐ Sizes—Resin and gelatine sizing and finishing compounds for all fibers and fabrics.
☐ Hydrocop & 3B Softener—Wax Emulsion WG, Wax Emulsion A, Ruxite A—for softening, conditioning, and lubricating all natural and spun synthetic yarns for knitting.
☐ Coning Oils—for all synthetic yarns—filament and spun.
☐ Hosiery Finishes—a complete line of resin hosiery finishes.
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☐ Antistatic Compounds—non permanent types for all fibers.

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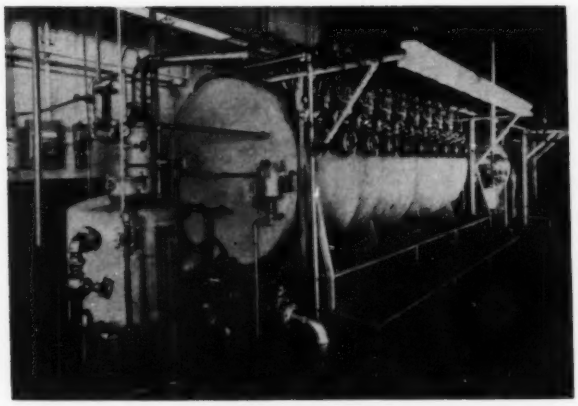


Jet Dyeing Machine

Jet Dyeing Machine

Gaston County Dyeing Machine Co, Stanley, NC, has announced the development of a new concept in fabric dyeing. An invention known as the Jet Dyeing Machine will be shown for the first time at the Knitting Arts Exhibition in Atlantic City during the week of April 24th.

The Jet Dyeing Machine is the result of a three-year research and development project by technicians and engineers of Burlington Industries, Inc and Gaston County. The pilot machine has been in operation for two years and a second production model for several months.

Burlington Industries has a patent application pending, and the patent is scheduled for issuance in early April. Patent protection is also being obtained in foreign countries. Burlington has licensed Gaston County to build and sell machines throughout the textile industry. Purchasers will be licensed by Burlington to use the machines.

Advance information from the Gaston County firm states that the jet principle for fabric dyeing has numerous advantages over beck dyeing now in use in the textile industry. The advantages claimed include the following:

1) Machine may be operated above or below boiling point as required
2) Low dye liquor ratio (10:1 versus 20:1 for conventional dye becks)
3) Uniform temperature maintained in all parts of dyebath at all times by controlled heating and cooling
4) Dyebath volume remains constant due to indirect heating and cooling by exchanger
5) No reels or drives to chafe and tangle strands of fabric
6) Fabric moved entirely by jet action and dye liquor flow
7) Friction eliminated since fabric is always encased in liquid
8) Level dyeing with no shading from side to side or end to end
9) Complete dyebath exhaustion
10) Improved colorfastness and brighter shades
11) Dark shades more easily obtained
12) Soaping and washing much faster and more thorough
13) Less chemical carriers required in processing certain man-made fibers
14) Fabric shrinkage uniform from end to end
15) Finished fabric has better hand due to rapid and constant agitation during processing.

●

Nylanthrene Red 4RL

A new offering of a neutral dyeing red for nylon was announced recently by Althouse Chemical Co.

Called Nylanthrene Red 4RL, the new Atlhouse product is replacing the previous offering of Nylanthrene Red 2RWF. It is said to be appreciably brighter in shade and has superior fastness to light. The tinctorial strength of this new color has been standardized to the Nylanthrene Red 2RWF, so that it reportedly may be readily substituted in any formulas, with little or no adjustment.

The new offering is said to serve as an excellent base for the dyeing of brighter shades of reds or as a shading color for compound shades.

Amacron Colors

The Chemical and Dyestuffs Division of Koppers Co, Inc, following years of research, has unveiled its new range of Amacron dyes in 14 colors, which reportedly can produce vividly all of the high mode shades, tailor-made for the popular polyester fibers.

The Amacron line is said to be outstanding because of its brightness, combined with properties assuring the utmost in fastness to light, washing, crocking, sublimation and perspiration.

For economy, Koppers' Amacron dyes are claimed to be outstanding for the following reasons:

1) Higher tinctorial value
2) Brighter (with blends of cotton and viscose)
3) Level dyeing with complete exhaust
4) Perfect dispersion
5) Combine with all other shades, blends and combinations
6) Build up deep shades without crocking
7) Perspiration resistant
8) Ideal for home machine washing and drying and commercial drycleaning.

The new dyes, which are said to have complete affinity together with highest fastness properties are designed to offer richer and deeper shades in all polyester fibers. In addition, it is claimed that any desired color can be matched with virtually complete assurance of fastness, including the shades such as scarlets, cerise, violets, bright greens and blues.

Because of their fastness properties to sublimation, the 14 Amacron colors may be applied by the heat-cure method (DuPont's Thermosal Method) and lose none of their brilliance, it is stated. In pressure dyeing the dyes reportedly can be applied without carriers.

The Amacron colors are offered as insoluble powder dyes with high dispersion. Water filter tests are said to show practically no dye specks. For those who wish to apply colors with a padder, Koppers also offers its Amacron range in liquid form, which also is said to be speck-free.

Another outsanding feature of the Amacrons is reported to be apparent in the dyeing of blends of polyester and cellulosic fibers. The Amacron colors are said to leave the cellulosic fiber practically unstained, thus making it possible to fill in cotton or viscose with appropriate matching or contrasting colors.

Likewise, the dyes are said to be appropriate for printing by roller or screen printing, since they give excellent speck-free prints and are fast to sublimation during steaming.

The following comprise the Amacron line: Yellow LS, Yellow 4R, Golden Orange 2R, Orange SF, Orange RF, Orange LS, Red FB, Red Violet LS, Violet B, Blue 3RLS, Blue FBL, Blue RLS, Black 4S extra.

Koppers is particularly enthusiastic about the blues, reds, and oranges. The Company states that "it is generally recognized that, within the range of 14 Amacron dyes offered, no other dyes can match the brightness, particularly the blues, reds, and oranges, which have unsurpassed properties of fastness and strength".

Further information and sample dyeings are contained in a booklet entitled "Amacron Colors on Polyester Fiber", which is being distributed by Koppers Co, Inc, Pittsburgh 19, Pa.

●

Liquid PED

McCarty Aniline & Extract Co, PO Box 2386, Charlotte 1, NC, is suggesting use of its Liquid PED in soaping as a method for reducing the tendency of materials dyed with reactives and other colors to bleed on storage.

Liquid PED, an 88% active product, is produced from aromatic alcohols ethylene diaminized.

The Company states that shades subject to humid acidic conditions and subsequent wet-out are loosened by hydrolysis, and can migrate to white material. It further states that reds, scarlets and orange shades are most subject.

It is claimed that Liquid PED is an added insurance against bleeding after storage, even though the goods are steamed in continuous process or undergo resin aftertreatment. This aftertreatment reportedly is not impaired by subsequent washing.

A suggested soaping formula calls for a thorough cold rinse; followed by a hot rinse; followed by a treatment at the boil, 10 to 20 mintes in bath, containing two parts Liquid PED to 1,000 parts of water. (One minute in continuous soaping).

Leon Moore (above, left), one of 12 Du Pont textile bleaching representatives, discusses a new Du Pont bleaching process . . .

Here's how Du Pont experience improve product quality

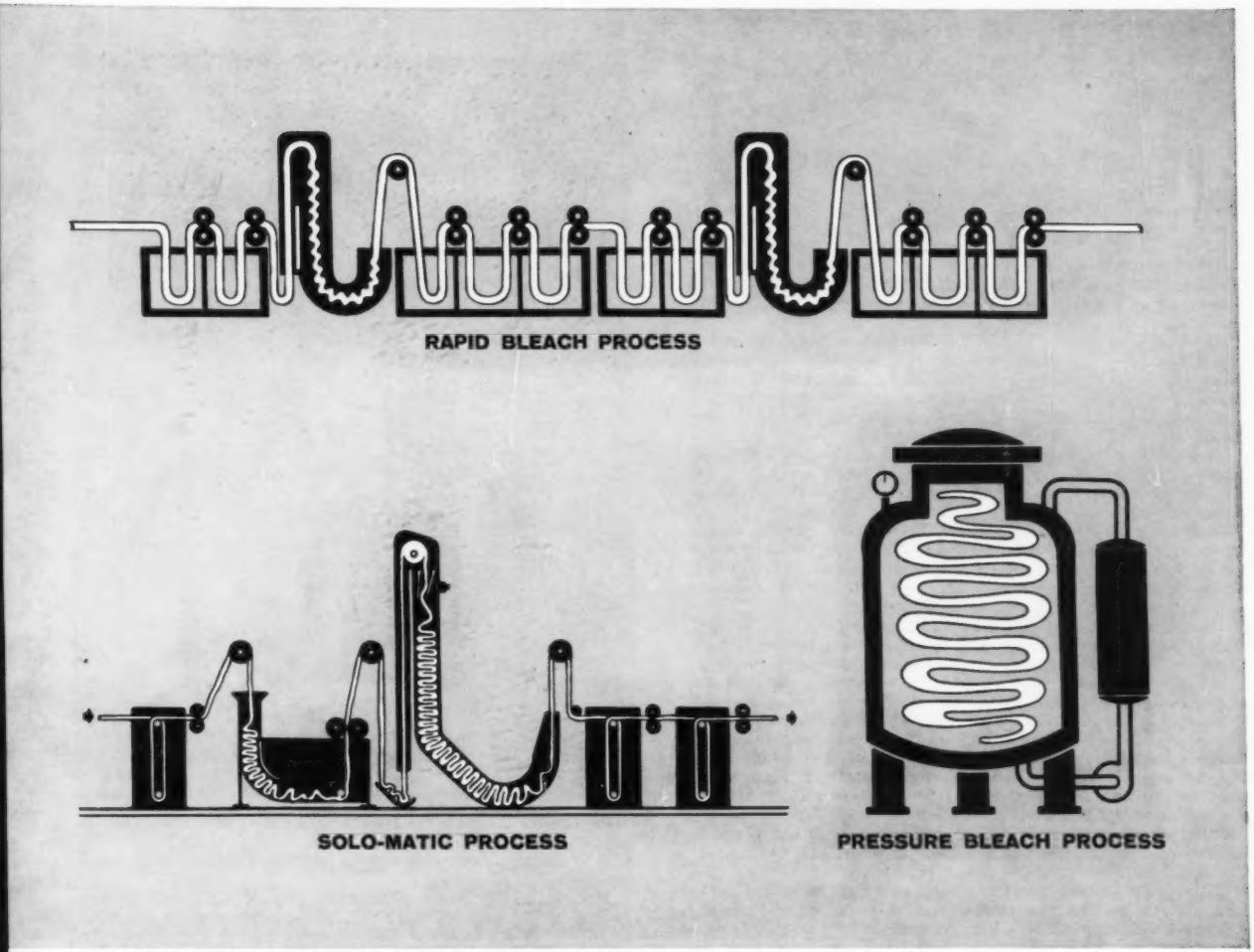
Du Pont technical representatives can bring years of practical textile mill experience to bear on your bleaching operations—and often will suggest ways you can cut costs or improve efficiency. For example, take Leon Moore (pictured above, left), one of Du Pont's twelve highly qualified bleaching specialists. He can help you maintain your processes at peak operating efficiency and also show you how one of Du Pont's new cost-cutting processes can economically fit into your present operation.

If it looks as though a continuous or semi-continuous system may solve your bleaching problems, Leon might suggest *Rapid Bleach*, the process that lowers cloth storage time to 8 minutes in each J-box, improves dyeing quality and eliminates rubmarks, bruises and creases.

If you bleach by a multi-stage, high-speed system, he can explain the advantages of *Solo-Matic* bleaching. This single-stage process can double your production in the same space, using present equipment—is currently performing satisfactorily in many mills.

Perhaps you're interested in kiers or package systems. Then Leon could tell you about *Pressure Bleach*, which cuts process time up to 50%, and doubles your production in the same space, using your present equipment.

ALBONE® hydrogen peroxide • **SOLOZONE®** sodium peroxide • **PERDOX®** sodium



These 3 Du Pont processes can help you save time, money and space. Major advantages are listed below.

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Leon Moore, or the Du Pont technical representative in your area, is backed by an experienced technical staff in Wilmington, Delaware, and a new Sales Technical Laboratory. Here, laboratory scale bleaching equipment designed to duplicate actual field conditions is used to help find practical answers to many of your bleaching problems. And Du Pont's new, modern plant in Memphis, Tenn., assures you fast, reliable deliveries of high-quality peroxides.

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Hy-Ad; Hy-Ad S

After three years of research, a new concept in the production of durable water- and oil-repellent finishes reportedly has been achieved by Arkansas Co, Inc, Newark, NJ.

Developed by Nat C Shane, vice president, and Herman G Weiland, head of the Silicone Research Laboratory, Hy-Ad and Hy-Ad S are being used as stabilizers and extenders for oil-repellent fluorochemicals in both water and solvent systems. No other products of the same chemical composition have been commercially produced in this country or abroad, it is claimed.

The stabilizing effect of Hy-Ad reportedly allows for greater compatibility with other desirable adjuvants in the presence of oil-repellent finishes, and prevents pad roll build-up.

Hy-Ad used with FC-208 (water system) and Hy-Ad S used with FC-203 (solvent system) reportedly improve oil and water repellency, in most cases, and also increase durability to laundering and drycleaning. In many formulas, smaller quantities of fluorochemicals may be used, due to an increase of efficiency, it is stated.

It is further stated that Hy-Ad produces a soft, full hand with good lubricity for sewing on high-speed machines. Its versatility reportedly is demonstrated in that it is advantageous even in the finishing glass-fiber fabrics.

According to Arkansas Co, Inc, Hy-Ad also produces hydrophobic properties on all textile fibers, and its antisoiling properties are outstanding when compared with other water-repellent finishes. Hy-Ad also helps to prevent build-up of static charges, it is claimed.

No afterwashing or neutralizing is required, it is stated, unless used in conjunction with thermosetting resins. When used in formulas for producing "wash-and-wear" finishes, resistance to abrasion reportedly is improved, as well as tear strength and angle recovery.

Several suitable catalysts are said to have been developed for use with Hy-Ad and Hy-Ad S in the production of durable hydrophobic effects with or without fluorochemicals. Hy-Ad and Hy-Ad S, used with their catalysts, reportedly produce durable water-repellent finishes on cottons which are resistant to laundering at the boil.

Other durable finishes can be produced by using Hy-Ad or Hy-Ad S in conjunction with the Hydro-Prufs, Arkansas Co, Inc's durable silicone water repellents.

Both products are presently available. A technical service bulletin on the new products is available on request to Arkansas Co, Inc, PO Box 210, Newark, NJ.

•

Webalarm

A new device for fabric, paper or plastic film inspection—the Webalarm—has been introduced by the Matrix Controls Co, Inc, PO Box 22, Somerville, NJ.

A "go—no go" gauge that signals audibly or visually when the width of a moving web falls outside preset tolerances, the Webalarm is said to be simple and easily installed on existing equipment, such as inspection perches, calenders, tenters, dryers or extruders. It reportedly is not affected by sideslip or speed variation of the moving material. "Snag-proof" wands are used to sense each edge of the web and the operator is alerted or the process stopped when width fails to meet specification.

Price of the unit is said to be under $400; four to six weeks availability.

•

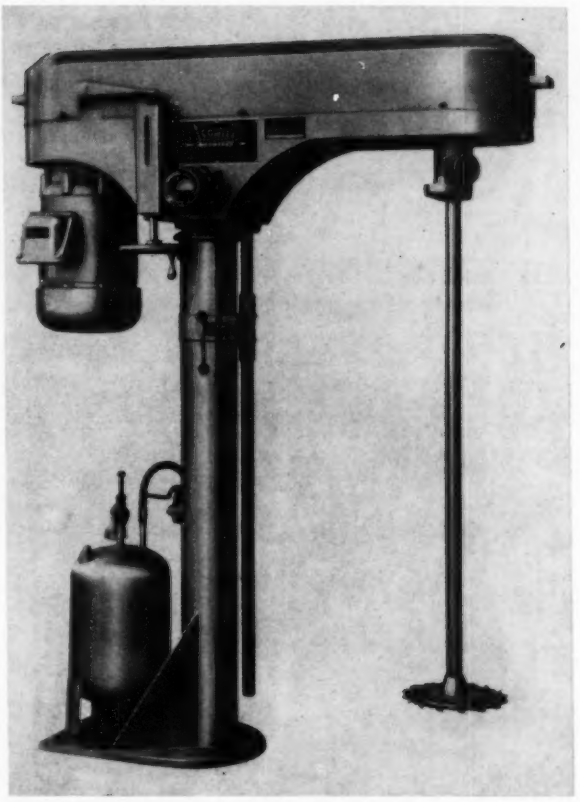
Cowles Dissolver, Super Series Model 515-VHV

Specially designed and engineered for low-to-medium volume production requirements, a new Cowles dissolver, Super Series Model 515-VHV, has been announced by Morehouse-Cowles, Inc.

Reportedly applicable to a wide variety of products, the new 515-VHV is described as "a high-speed, high-shear, impeller-type unit capable of mixing, dispersing, deagglomerating, etc, materials up to 50,000 centipoises or more."

Powered with 10-15 HP motor, it reportedly will handle 50- to 200-gallon batches, depending on nature of product and processing required.

The unit is equipped with the Cowles impeller, 10" × 13" in diameter as determined by motor size, and the MPD (maximum power delivery) variable-speed transmission system, which is said to be capable of delivering over 90% of motor horsepower to the impeller even at slowest speeds.



New Cowles dissolver for low-to-medium volume requirements

It is fully instrumented, with built-in ammeter and tachometer.

Hydraulic lift has a maximum rise of 42", with bridge length of 62" and width of 15". Base dimension of machine is 18" × 24½"; lowered 83". Speed range is approximately 600 to 1850 rpm. Shipping weight is approximately 1500 lbs.

Full information will be sent upon request to Morehouse Cowles, Inc, 1150 San Fernando Rd, Los Angeles 65, Calif.

•

Fiberloc

Fiberloc, a new fabric mechanically bonded for a wide variety of applications, is now being introduced by The Felters Company. Manufactured from synthetic fibers, it is bonded by a technique that is said to entirely eliminate the normal felting process. The new material reportedly is stronger and has greater resistance to wear and decomposition than many felts produced by other methods.

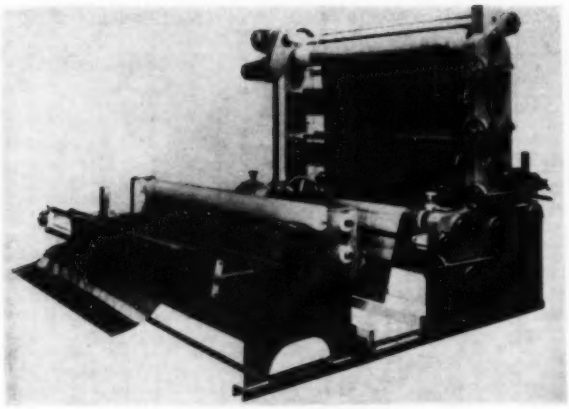
Fiberloc can be produced with any man-made fiber, it is claimed, and is now offered in Dacron, Orlon, nylon, viscose, acetate, Arnel, polypropylene or in various combinations in widths up to 108" and with thicknesses up to 1".

Permeability is controlled in manufacturing, making Fiberloc useful for filtration applications. When exceptional tensile strength is required, Fiberloc reportedly has a supporting center with which tensile strengths up to 1500 psi are obtained. Fiberloc can be die cut to precision shapes without fraying or raveling, it is claimed.

The use of synthetic fibers is said to eliminate problems such as mildew and fungi attack, caused by bacterial growth on natural fibers. When special fibers are employed, Fiberloc is also said to be highly resistant to acids and alkalis, and will withstand temperatures up to 350 degrees.

It is reported that Fiberloc has been thoroughly tested for a wide variety of applications, including padding, seals, wicks, insulation, reinforcement, filtering laminates and gaskets. Almost 50 different types of Fiberloc are now available, in rolls, sheets or as precision-cut parts and shapes.

Martin L Stone has joined The Felters Company to market Fiberloc. Full information on the new product and its applications can be obtained from The Felters Co, 1803 Empire State Building, New York, NY.



van Wees wet-brusher

van Wees Wet-brushing Machine

A single-operation wet-brushing unit is the latest piece of Netherlands textile equipment ready for export.

Developed by Machinefabriek JAF van Wees, this wet-brusher reportedly eliminates the need to brush the same fabric several times. Textiles are said to be intensely brushed and finished with a deep gloss without shifting a single roller.

In the first of several functions performed, the fabric is fed through an immersion tank—free of the brushing unit—in which a heating element is located. Here the deep gloss is imparted.

The fabric next moves between squeezing rollers and then, via a stretching device and brake drum, passes along three high-speed brush rollers, which perform the brushing. One of these is a hair brush and the other two are copper trimming brushes. In the next-to-last step the fabric is passed through a felt roller to impart the after-gloss and is finally rolled by a drawing roller.

Of interest is the regulatory system by which each stage is controllable. A fabric tension regulator with a control range of 1-25 reportedly determines the intensity of brushing, and the rate of passage of the fabric can be adjusted by means of a variator, irrespective of the speed of the rotating brushes. In addition, the area of contact between the fabric and each of the brushes can be independently adjusted, it is claimed, even to the extent of withdrawing one or more brushes from actual contact. Such adjustments are said to be effected by means of a turn-wheel and can be read on a graduation for each brush.

Fluff and loose particles are collected in a trough in order that the bolts of textiles may be ready for shipment without further cleaning.

To prevent corrosion staining of fabrics, all parts of the unit which come in contact with the textiles are constructed of stainless steel, ebonite or plastic.

The van Wees wet-brusher occupies a floor area 9′ square and stands 7½′ high. The brushes are driven by a five-hp motor, and the drawing roller and winder by a two-hp motor.

For further information, contact the Netherlands Trade Commission, 551 Fifth Avenue, New York 17, NY.

●

Softener 4

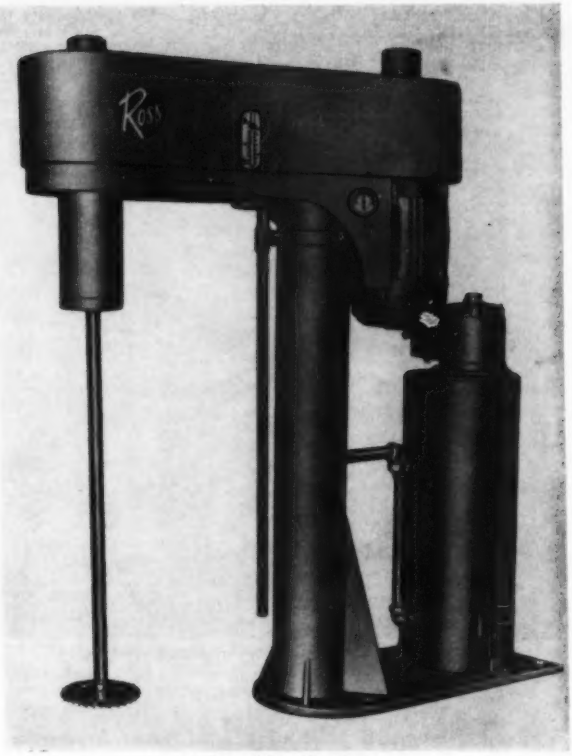
After extensive testing, a new nonionic softening agent for synthetic knitted and woven fabrics is being offered by the W F Fancourt Company.

The new product, called "Softener 4", reportedly has excellent nonyellowing and gas-fading properties along with an ability to impart a high degree of softness and body to fabrics.

Softener 4 can be used alone or in combination with other finishes, according to Fancourt, and will withstand normal drying temperatures.

Additionally, the new softening agent can be applied to knitted and woven elastic fabrics and is reported suitable for treating bleached, dyed and printed textiles.

Detailed information can be obtained by writing to the Fancourt Company, 516 S Delaware Ave, Philadelphia 47, Pa.



Model #140DI disperser

Model #140DI Disperser

A new, vertically raised high-speed disperser has been added to the line of mixing and dispersing equipment manufactured by Charles Ross & Son Co, Inc, 148-156 Classon Ave, Brooklyn 5, NY.

This large-capacity machine, model #140DI, reportedly mixes, disperses and deagglomerates products of medium heavy paste consistency up to 60,000 Centipoises in any capacity between 100 and 800 gallons. Up to 60 HP motor drives are provided for processing the heaviest types of products, and variable-speed drives are said to enable setting the shaft speeds anywhere between 600-3000 rpm. It is stated that the advanced-type impeller on these machines is a high-impact multiple-action millhead with specially machined internal chambers. Material is first subjected to tremendous direct impact and intense abrasive action within the millheads before being jetted out in thin streams from the slow-moving surrounding material for greater attrition and hydraulic shear.

These larger and heavier duty machines center in tanks up to 6′ diameter, and automatic hydraulic cylinder reportedly permits raising from tanks up to 6′ deep. Greater 360° swing enables tanks to be grouped around the column when necessary to keep the machine in continuous use, it is stated. The manufacturer reports that, in many installations, these new dispersers have proved to provide complete processing of products in one machine.

Complete information and literature is available from the manufacturer.

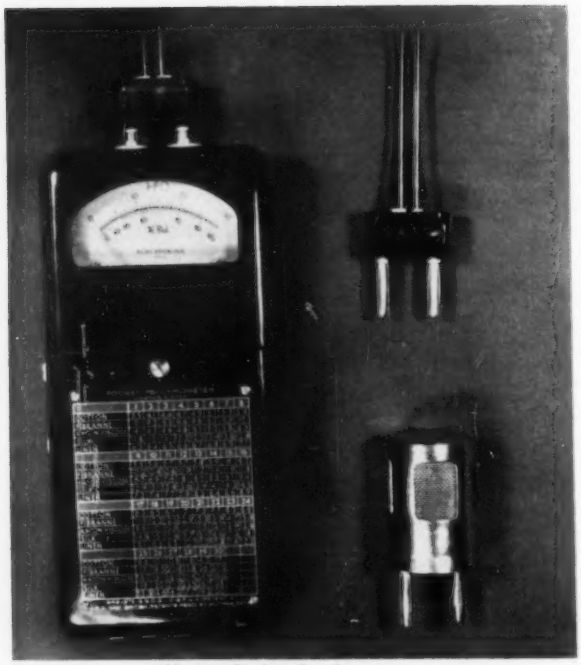
●

Althouse Nylanthrene Line Matches British Accent 1961 Sportswear Colors

Sportswear fashion, styling and coloring will have a British accent in 1961, according to the National Association of Men's Sportswear Buyers.

The favored British colors have been matched on stretch nylon by Althouse Chemical Co with its Nylanthrene dye line, which reportedly has proved highly successful for many years for sportswear fastness specifications.

The Nylanthrene dyes are reported to be among those suited for the stretch nylon because of their excellent coverage, easy application and fastness properties.



Hunter Pocket Psychrometer

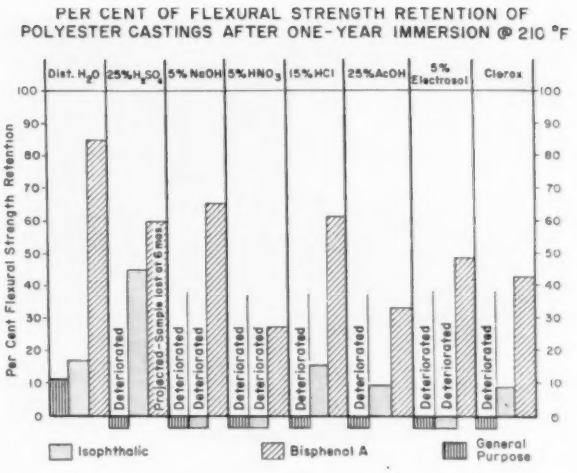
Pocket Psychrometer

A transistorized, battery-powered pocket model of the Hunter Psychrometer, which utilizes the Eicken System for moisture detection, now is available. The Pocket Psychrometer, only a little larger than a pack of king-size cigarettes, is said to provide a quick, accurate method for determining the moisture content of raw fibers, yarns in skeins, cops and a variety of packages, and fabrics; as well as bulk materials, such as powders. The principle on which it operates is based on consideration of the total electrical phenomena which indicate moisture content under expected plant processing conditions.

The measuring versatility of the Hunter Pocket Psychrometer is said to result from the development of a variety of special sensing devices, which are connected by a plug-in attachment to adapt it to the particular material being processed.

Two types of Pocket Psychrometer are offered for the textile industry's use. One contains special circuitry for measuring moisture in cotton, rayon and other cellulosic fibers, as well as polyester and acrylic synthetics. The other is for use with wool, nylon and similar synthetics. A special measuring element also is available, which determines relative room air humidity.

The Hunter Pocket Psychrometer is manufactured by Hunter, Inc, licensed exclusively to produce and sell the Eicken System Electro Psychrometer in the Western Hemisphere. It is available from the shelf, from James Hunter Machine Co, North Adams, Mass; and Hunter, Inc, Mauldin, SC. The pocket unit complete with sensing element is designed to sell for under $200.



One-Year Immersion in Corrosive Solutions Shows Significant Differences in Corrosion Resistance of Various Polyester Types

A report on the physical properties of various types of polyesters after immersion in corrosive solutions for a one-year period, released recently by Atlas Powder Co, Wilmington, Del, points out that the ability of a polyester to withstand corrosion depends upon the specific chemical structure of the plastic. According to S S Feuer, development supervisor, Chemicals Division, the wide differences in the performance of these materials makes it vital for designers and fabricators of corrosion-resistant equipment in the textile, chemical processing, and other fields to go through a careful evaluation before specifying a particular plastic for an application.

In the one-year tests, three types of polyester resins—bisphenol A, isophthalic, and general purpose—were made up into castings and immersed in eight corrosive solutions: distilled water, 5% sodium hydroxide, 5% nitric acid, 25% sulfuric acid, 15% hydrochloric acid, 25% acetic acid, Clorox, and 5% Electrosol, all at 210°F.

The test results reportedly show that general-purpose polyester (prepared from polypropylene glycol, maleic anhydride, and phthalic acid) should not be used where corrosion resistance is required. In all the test solutions except for distilled water, the general-purpose polyester deteriorated after being immersed from one to six months. The isophthalic polyester (prepared from propylene glycol, maleic anhydride, and isophthalic acid) survived only sulfuric acid, hydrochloric acid, distilled water, and Clorox, but lost most of its structural strength in all but the sulfuric acid. Bisphenol A polyester (prepared from propylene oxide, bisphenol A, and fumaric acid) survived in all of the test solutions after a one-year immersion and retained over 40% of its original flexural strength in all solutions except for nitric acid and acetic acid.

A copy of the complete report and subsequent reports on longer exposures can be obtained free of charge from the Plastics Marketing Section, Atlas Powder Co, Wilmington 99, Del.

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New CFMC Colors

Compagnie Francaise des Matieres Colorantes, Paris, France, has placed on the market four new colors: Acetoquinone Light Blue Green 4JL, Chrome Fast Brown RL, Sulfanosol Olive Yellow 5J, and Sulfanosol Olive BR.

Acetoquinone Light Blue Green 4JL is a new plastosoluble dyestuff said to be considerably brighter than the dyestuffs of the same type and of a similar shade. It may be used on acetate, polyamide and polyester fibers, reportedly having very good lightfastness and very good fastness to heat treatments on the latter. It starts to sublimate at 180°C (356°F). The brightness of its shade reportedly is appreciated for compound shades.

Chrome Fast Brown RL reportedly brings to the chrome colors range for wool several interesting properties. It is said to have very good solubility and satisfactory leveling properties. Dyeings obtained are said to be very fast to wet treatments and to carbonizing.

Sufanosol water-soluble sulfur dyestuffs are without substantivity for the fiber, which is said to make them very important for pad dyeing. Sufanosol Olive Yellow 5J and Sulfanosol Olive BR extend the range of brands already available and reportedly give shades ranging from pale beige to deep khaki.

For further information, write to Francolor Inc (a division of CFMC), 148 Hamlet Ave, Woonsocket, RI.

•

Isochemducts 2.5 and No Mix

Isochem Resins Co, 221 Oak St, Providence 9, RI, has announced a series of conductive adhesives based on a new type of conductive silver that is said to be a true conductor over a wide temperature range.

The Isochemduct 2.5 is a two-part system that is said to offer top conductivity while the Isochemduct No Mix is said to give no pot life plus no mixing losses on this expensive-type adhesive.

Isochemducts are available in a variety of viscosities.

A technical data bulletin is available from Isochem Resins Co on request.

Seqlene Fe-900 and Fe-1300

Two new Seqlene-brand sequestrants, said to be especially effective in sequestering iron from strongly alkaline solutions, are now available in commercial quantities from the A E Staley Mfg Co, Decatur, Ill.

Seqlene Fe-900 and Fe-1300 are water solutions composed chiefly of sodium beta-glucoheptonate. They differ only in solids, Seqlene Fe-900 having about 35 percent solids, and Seqlene Fe-1300, 50 percent.

Seqlene sequestrants are bottle and equipment cleaning agents marketed by Staley's under an exclusive contract distributorship agreement with Pfanstiehl Laboratories, Inc, of Waukegan, Ill. With the addition of Seqlene Fe-900 and Fe-1300, Seqlene sequestrants are now commercially available in two liquid series and one dry form.

Because they are said to particularly effective in strong alkaline solutions, Seqlene sequestrants have found application in general fields of alkaline derusting and cleaning, and in treating hard or rusty water. They are said to effectively sequester not only iron but calcium and magnesium, as well as other metal ions such as aluminum, copper, nickel, manganese, cobalt, zinc and silver. They are generally used alone with alkali or with alkali plus a wetting agent.

Further information on the new Seqlene Fe-900 and Fe-1300, and a new technical data sheet on the entire family of Seqlene sequestrants, are available by writing the Staley Company.

•

New Latex Backing

General Latex and Chemical Corp, Cambridge, Mass, has announced the availability of a new latex backing for fabrics which is said to offer excellent dye receptivity. General Latex's new line of upholstery compounds reportedly receives the dye to the extent that the backing is the same color as the fabric. These compounds are available from General Latex and Chemical Corp plants located in Charlotte, NC; Dalton, Ga; Ashland, O; Brampton, Ontario; and Montreal, Quebec.

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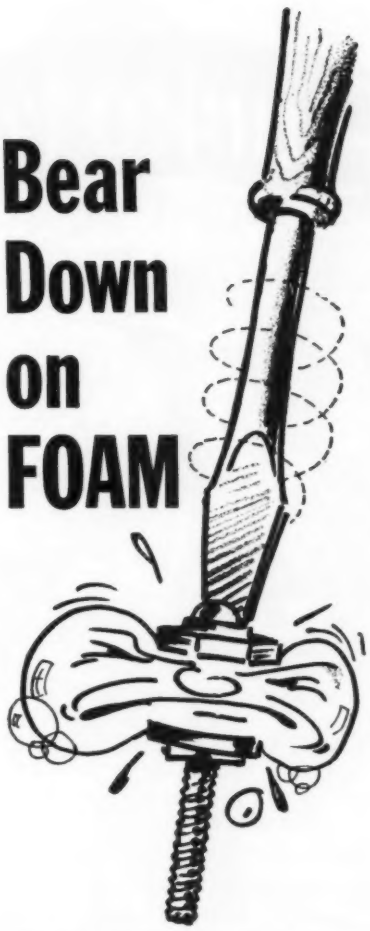

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ADR ADVERTISING INDEX

Allied Chemical Corp.
National Aniline Division 28, 29
Nitrogen Division
Solvay Process Company
Althouse Chemical Company
American Cyanamid Co. Fourth Cover
American Dyestuff Reporter
American Dyewood Co., Inc.
Ansbacher-Siegle Corporation
Antara Chemicals Div., General Aniline & Film Corp.
Apex Chemicals Co., Inc. 15
Arkansas Company, Inc. 8
Arnold, Hoffman & Co., Inc. 9
Atlantic Refining Co., The 5
Atlas Electrical Devices Co.

Baker Chemical Co., J. T.
Becco Chemical Division
Food Machinery & Chemical Corp. 11
Berkshire Color and Chemical Corp.
Birch Brothers, Inc.
Burkart-Schier Chemical Co. 72
Butterworth & Sons Co., H. W.

Calgon Company
Campbell Company, Inc., John
Carbic-Hoechst Corp.
Chemical Products Corp.
Chlor-Alkali Division
Food Machinery and Chemical Corporation 54
Ciba Company, Inc. Front Cover
Columbia Southern Chemicals
Crescent Chemical Company, Inc.

De Paul Chemical Co.
Dexter Chemical Corp. 70
Diamond Crystal Salt Co.
Dow Corning Corp. 71
Drew & Co., Inc., E. F.
duPont de Nemours & Co., Inc., E. I. 64, 65

Eastern Color & Chemical Co.
Eastman Chemical Products, Inc. 14
Emery Industries, Inc.
Emkay Chemical Co. 68

Fablok Mills, Inc.
Fancourt Co., W. F. Third Cover
Farbwerke Hoechst, A. G.
Feeley Co., E. J.
Food Machinery & Chemical Corp.
Becco Chemical Division 11
Chlor-Alkali Division 54
Foxboro Co., The
Frankl Associates, Inc., Ernest L.

Gaston County Dyeing Machine Co.
Geigy Dyestuffs
Division of Geigy Chemical Corporation 16
General Aniline & Film Corp. 12
General Dyestuff Company 12
Goodyear Chemical Division
Goodrich Chemical Company, B. F.
Gross & Company, A.

Hagan Chemicals & Controls, Inc.
Hampshire Chemical Corporation
Harchem Division, Wallace & Tiernan, Inc.
Harshaw Chemical Co., The 13
Hart Products Corporation, The
Hercules Powder Company
Heyden Newport Chemical Corporation
Hilton-Davis Chemical Co., Division 18
Hoechst Chemical Corp.

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ADR ADVERTISING INDEX

Interchemical Corp., Color & Chemicals Division 6, 7
International Salt Co. 30

Klauder Weldon Giles Mach. Co. 69
Knitting Arts Exhibition
Kolker Chemical Corp.
Koppers Company, Inc. 3

Laurel Soap Manufacturing Co., Inc. 62

Maher Color & Chemical Company
Manufacturers Chemical Company, Inc. 73
Marbon Chemical Div. of Borg-Warner Corp. 52
May, Inc., Otto B.
McCarty Aniline & Extract Co.
Metalsmiths Div., Orange Roller Bearing Co., Inc. 73
Moretex Chemical Products Inc. 71
Morton Salt Co.

National Aniline Division
Allied Chemical Corp. 28, 29
National Starch and Chemical Corporation
Nitrogen Division, Allied Chemical Corp.
Nopco Chemical Company
Nyanza Color and Chemical Co.

OPW-Jordan
Organic Chemical Corporation 74

Philadelphia Quartz Co.
Photovolt Corp.
Procter & Gamble Co. 73
Putnam Chemical Corp.

Reading Scientific Company
Refined Products Company
Rhodia, Inc.
Rohm & Haas Co. 56
Rona Pearl Corporation
Royce Chemical Company
Rudnick, Representatives, Edward S.
Rumford Chemical Works 27

Sandoz, Inc.
Scher Brothers
Scholler Bros., Inc. 10
Seydel-Woolley & Co. 51
Shell Chemical Company
Solvay Process Division, Allied Chemical Corp.
Sou-Tex Chemical Company, Inc.
Standard Chemical Company
Sun Chemical Company ..... -

Tanatex Chemical Corp. ..... Second Cover
Taylor Instrument Companies
Tennessee Corporation 62
Tex-Chem Co.
Texize Chemicals, Inc.
Toshin Kogyo Co., Ltd.
Turbo Machine Company

Union Carbide Corp.

Verona Dyestuffs

Virginia Smelting Company
Wallace & Tiernan, Inc., Harchem Division
Wallerstein Company
Warwick Chemical Division
Watkins Salt Co.
West Indies Chemical Works, Ltd., The
Wica Chemicals, Inc. 4
Wolf & Co., Jacques

Young Aniline Works, Inc.

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Colorful Era Continues Into Fall 1961

Reports from abroad as well as from home markets show a definite trend towards deep, bright, clear colors in fall fabrics. Whereas in the past color effects left much to the viewer's imagination, colors in the '61 palette speak for themselves in clear and positive tones. Instead of strong contrasts, however, fashion often combines three or more colors of the same depth of value.

At this writing, deep bright pinks—ranging from *mauvey pink* to *black raspberry*—appear as a leading color family. This purple-influenced group will tend to replace the currently successful lilac range. Among the reds, *orange cast, flame* (appealing particularly to the young markets) may come up as a single important color, rather than a family. *Blues* cover the field—with clean, fresh, true blues, grey blues, etc. The newest is softened, green-influenced blue sometimes called Teal. There is a possibility of renewed interest in winter navy. *Greens* are somewhat more blue cast than last season, but still not cold and harsh. Emerald and Forest green are prominent. There is one accent green which is an exception—an extremely yellow chartreuse. Newest *browns* are orange versions of rust, bittersweet, sienna; there is some continuation of chocolate. *Yellow* is no longer gold, but strongly orange cast as in squash. Newest of the *neutrals* is a strong revival of grey, used alone or in combination of colors; chamois and warm beiges continue in favor, with some interest in brown taupes.

Solid color or patterned, the new fabrics herald a bright and beautiful fall season...with the clear, deep colors of high quality making Cyanamid Dyes more important than ever.

Some Effects of the Pitting of Dyeing Machine Metals

Improvements in the quality of stainless steels now being used for manufacturing dyeing and processing machinery have greatly reduced the vexing problem of pitting and roughening of the surfaces. However, with the introduction of hydrophobic fibers (high polymer) the industry has increased its use of corroding chemicals, such as sodium chlorite, and therefore some corrosion does occur despite these improvements.

Rubbing against the corroded or pitted stainless steel can cause scuff or abrasion marks in all fabrics. Wool fabrics and fibers were used for the illustrations here, but all other fibers exhibit a similar effect. These marks appear lighter, or weaker in shades, as though less dye had been absorbed.

Microscopical examination, however, shows that the fibers in these lighter areas have been shredded and more fiber surface has been exposed. This causes the fiber to reflect more light and thus to appear weaker in shade. When Orlon and Dacron fabrics are rubbed over the pitted metal, the scuff-mark appears lighter and greyer, probably because some of the fibers are shredded while others have been cut off as though with a razor blade.

Microscopical examination of the pitted metal shows that some parts have been dissolved away, leaving tiny, comparatively deep caves. Razor-like edges appear on those sections of the metal surfaces which are more resistant to corroding chemicals. When a piece of dyed wool fabric was rubbed over the pitted metal, light "resist" marks were produced as shown in Figure 1.

In Figure 2, note the shredded appearance of the wool fibers removed from the light areas seen in Figure 1. Figure 3 is a photomicrograph taken through the microscope at 200 x magnification. It shows the caves bridged by razor-like edges of undissolved metal, which cut or shred these fibers.

Figure 4 is a radioautograph produced by filling the dissolved-out areas with a finely-produced radioactive material which emits gamma rays. The surface of the metal is wiped clean, then a negative is placed on the metal (held down by a heavy lead weight) and allowed to remain in direct contact with the metal surface for 48 hours. In this case, we used the radioactive material Uraninite (which is less dangerous to handle). The gamma rays emitted by the mineral remaining in the caves produced an image on the negative as shown in Figure 4. The bright specks are caves filled with radioactive mineral. The dark areas are parts of the metal surface that had been wiped clean. The larger area shown in the lower right hand corner is a badly pitted section.

Excessive pitting of stainless steel may be retarded by periodic buffing, polishing, and by a passivation treatment with sodium bichromate and nitric acid. The elimination of corrosive chemicals, wherever possible, helps to prolong the satisfactory life of stainless steel. Also, molybdenum fortified stainless steel has a longer serviceable life.

FIG. 1—*A photograph of a resist mark produced by rubbing worsted serge over a sheet of pitted stainless steel.*

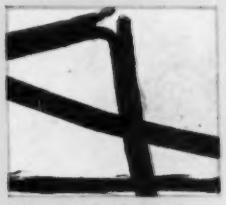

FIG. 2—*A photomicrograph of shredded wool fibers removed from the light area in Figure 1.*

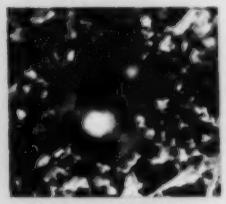

FIG. 3—*A photomicrograph of the pitted stainless steel. Note caves and razor-like edges of resistant parts of the metal.*

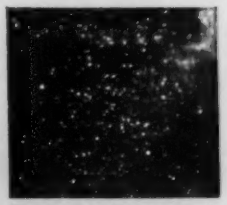

FIG. 4—*a radioautograph obtained by filling the pitted areas in stainless steel with a radioactive material. The negative was in contact with the metal surface for 48 hours.*